Dual Care in Australia: The predictors and impacts of combining informal care with other child care responsibilities

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Declaration

This thesis is the original work of the author as a PhD candidate in the School of Demography of the College of Arts and Social Sciences, The Australian National University.

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This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the author and should not be attributed to either FaHCSIA or the Melbourne Institute.

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Abstract

Due to the ageing of the Australian population, increased female labour force participation, delayed childbearing and the obesity epidemic, Australia's caring needs will likely increase significantly in the near future. Those who provide informal care and child care offer an invaluable service to Australian society in meeting those needs. Although there is significant research available regarding the provision of these types of care separately, there is a stark absence of research that addresses those who provide both types of care at the same time. This thesis examines the experiences of dual carers in Australia, who combine informal caring responsibilities with other child caring responsibilities.

Dual carers will constitute an integral part of our ability to meet Australia's increased caring needs, and we currently know very little about what characteristics make people more likely to become dual carers. We also know little about how dual caring impacts upon those providing it. This thesis addresses this lack of knowledge by examining and analysing the predictors and impacts of providing dual care. It finds that dual carers are unique from other Australians who have no caring responsibilities, and those who provide only informal care or child care separately.

To identify the predictors and impacts of dual caring, this research performs quantitative, longitudinal analysis of a nationally representative data set, the Household Income and Labour Dynamics in Australia (HILDA) survey. Cross-sectional analysis is also performed on data from the 2011 Australian Census. Event-history analysis is used to identify and analyse the predictors of dual care, and the impacts of dual care are examined through the use of multilevel modelling.

This thesis finds that being female, living with a partner (particularly being a partnered women), being aged 35 to 44, not being employed full-time (especially being unemployed), not having a bachelor's degree or higher and having a higher disposable income all significantly increase the risk of becoming a dual carer. The characteristics that increase the hazard of dual caring are unique from those which increase the hazard of informal care or child care on their own.

This research also shows that the provision of dual care has unique impacts that are different to the impacts of informal care or child care. The key impacts of the provision of dual care identified by this thesis are; lowering of life satisfaction, reductions in physical and mental health and wellbeing, decreases in labour force participation and employment, and increases in relationship breakdown. The impacts of dual care are significantly different from the impacts of informal care or child care in that dual care is frequently associated with the poorest outcomes across nearly all measures analysed.

This thesis makes an original contribution to knowledge by comprehensively examining dual caring in Australia, and analysing the predictors and impacts of providing dual care.

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Chapter One: Introduction

Thesis Statement

Dual carers are different in significant ways to informal carers, child carers and those with no caring responsibilities. This thesis examines how people who combine informal caring responsibilities with child care responsibilities (dual carers) are different to those who do not.

Introduction

In Australia, close to 2.7 million people provide informal care to Australians who require assistance due to disabilities, long term health problems or being frail aged (Australian Bureau of Statistics 2016c). This informal care is unpaid, ongoing and often provided by family and friends. Separately from that informal care, over 3.9 million Australians report having informal *child* care responsibilities, meaning they provide unpaid, ongoing care to children (Australian Bureau of Statistics 2011b). This informal child care is generally provided by parents or grandparents. A small, but significant proportion of the Australian population combine these two types of caring responsibilities. These are the dual carers and they provide an incredibly valuable service to Australian society.

As the Australian population ages, delays childbearing, increases female labour force participation and experiences the obesity epidemic, Australia's caring needs are likely to grow significantly, while our ability to meet those needs is likely to decrease. In Australia, the vast majority of care needs are met informally, meaning the care provided is unpaid and performed by family and friends (Australian Bureau of Statistics 2016b).

Given the current reliance on unpaid care, it is likely that Australia's increasing care demands will continue to fall primarily to everyday Australians to provide

informally. Should Australia fail to meet these demands informally, the cost of formally meeting the increased caring need would be astronomical (Deloitte Access Economics 2015). In order to meet the increasing need for care and to properly support those providing care, it is crucial to examine what the predictors and impacts of providing care are. Failure to understand this will severely impact the ability of our society to meet its caring demands. An awareness of the predictors of care will allow us to identify and support people who become carers. Understanding the impacts of providing care will allow us to prevent or mitigate the negative effects, which have their own costs to society as well as discouraging others from taking on caring responsibilities.

This thesis hypothesises that the predictors and impacts of the provision of dual care are significantly different to the predictors and impacts of providing informal care or child care separately. The provision of dual care not been adequately examined by the existing body of Australian research; this thesis therefore addresses a significant gap in the literature by identifying and analysing those unique predictors and impacts of dual care.

This introductory chapter orients the reader to the thesis as whole. It begins by providing the context of the provision of dual care in Australia. This includes outlining the current demographic changes within the population that are likely to increase the demand for care, as well as impact the ability of the Australian population to meet that increased demand. This discussion will focus on four key phenomena; the ageing of the Australian population, delayed childbearing, increased female labour force participation and the obesity epidemic. Following the discussion of these demographic trends, the importance of understanding dual care will be demonstrated and the gap in the existing research identified. The specific research questions of the thesis will then be detailed, followed by an outline of the entire thesis with individual chapter synopses. The outline of the thesis not only situates the reader and

provides a guide for what is to come, it also clearly demonstrates how each chapter contributes to answering the key research questions and addresses the overarching research aim of the thesis.

The context of dual care in Australia

The single most important aspect of the context of dual care in Australia is the likelihood of a significant increase in our caring requirements in the future, coupled with a decreased ability to meet those requirements. In a recent report forecasting the supply and demand of informal care, Deloitte Access Economics (2015) calculated that the demand for care will outstrip the supply of care in Australia within the next ten years. It is this context which is explored in the following sections.

Increasing caring requirements (and decreasing ability to meet those requirements) are driven by four key factors. These are; population ageing, delayed childbirth, increasing female labour force participation and the obesity epidemic. All these factors link to each other in complex ways, and all are demonstrably driving change in potential care requirements and provisions in their own unique ways. The first of those demographic trends to be investigated here is the ageing of the Australian population.

Population ageing

Population ageing is a demographic trend well researched and established both in Australia and across the world (Grant, Hoorens et al. 2004, Lutz, Sanderson et al. 2008, Australian Bureau of Statistics 2013j, Hugo 2013, United Nations 2015). Caused by increasing life expectancy and decreasing fertility rates, population ageing is defined as an "increasing share of older persons in the population" (United Nations 2015: 1). Population ageing can be measured in a number of ways; two of the most common measures are the proportion of the population aged over 65, and the median age of the

population. Both these measures have been used to demonstrate population ageing that has already happened, and projected future population ageing in Australia.

The Australian Bureau of Statistics (ABS) demonstrates that the Australian population has already undergone significant population ageing, and that the population will continue to age over the coming years. In the five years between 2010 and 2015, the number of people aged 65 years and over in Australia grew by 19 per cent; an increase of nearly 600,000 people in the older age groups (Australian Bureau of Statistics 2016e). The same data also show that from 2010 to 2015, the median age of the Australian population increased from 37.0 years to 37.4 years. Another way of interpreting the ageing of the population is via the dependency ratio. The dependency ratio compares the proportion of those who are outside of the typical working age groups (the 'dependents') to those who are working aged (aged 15-64). In 2014, the Australian Bureau of Statistics reported a dependency ratio of 50 per cent, or a ratio of 1:2, meaning there were 50 'dependents' for every 100 'workers'. Continuing fertility and migration trends of the time, it was predicted that the dependency ratio would by 65 per cent, by the year 2063 (Australian Bureau of Statistics 2014).

In terms of future population ageing, by the year 2101, the median age of the Australian population is projected to fall between 43.1 years and 46.2 years of age (Australian Bureau of Statistics 2013j). For the same time period, the proportion of the population aged over 65 is expected to grow by between 24.6 and 27.1 per cent, resulting in somewhere between 11.5 million and 18.1 million Australians aged over 65 in 2101 (Australian Bureau of Statistics 2013j).

Population ageing impacts both the demand for care, and the ability of Australian society to meet that demand. As the aged section of Australia's population grows in both number and proportion, so too will the number and

proportion of Australians requiring care. By definition, the need for assistance is determined by being frail aged, having a long-term illness or a disability. Australian research clearly establishes that the risk of experiencing all three increases with age (Australian Institute of Health and Welfare 2000, Hugo 2007, Australian Bureau of Statistics 2016b). This positive association between old age and an increased rate of requiring assistance due to long-term health problems, disability and being frail aged is demonstrated further in the literature review chapters.

In addition to increasing Australia's overall caring requirements, the ageing of the population could also impact the supply of potential carers. As the proportion of older Australians increases, the proportion of younger Australians must logically decrease accordingly (even if the number of younger Australians grows). This means that there will be a smaller proportion of the population available to provide care to a larger proportion of the population who will require care. In other words, the ratio of potential care providers to care recipients could worsen, leaving proportionally less Australians to provide care, and proportionally more requiring care (Deloitte Access Economics 2015).

The ageing of the population could also reduce the supply of informal carers in that people who currently provide long-term care (often to adult children living with disabilities or long-term health issues) could themselves 'age out' of their ability to provide care. Specifically, this 'ageing out' refers to potential carers ageing and finding themselves physically, mentally or practically unable to provide care, due to advanced age. A possible counter argument to this is that the increased older population could experience 'healthy ageing' thanks to medical advances and improvements in lifestyle. The World Health Organisation defines healthy ageing as "the process of developing and maintaining the functional ability that enables wellbeing in older age"(World Health Organization 2018). Should healthy ageing be achieved for a majority

of the older population, it follows logically that the potential pool of carers could actually increase. In spite of the possibility of increased 'healthy ageing', the potential for a significant section of the population to 'age out' of their ability to provide care has been identified as a possibility by a number of studies (Jenkins, Rowland et al. 2003, Deloitte Access Economics 2015). Even allowing for the potential of healthy ageing does not guarantee that those older Australians would chose to provide care. Indeed, increasing ages of retirement and increased female labour force participation could mean that those who have experienced healthy ageing choose to remain in the workforce, rather than taking on unpaid caring responsibilities. Competing labour force participation reducing the potential pool of carers is explored further in a later section of this chapter. Overall, the ageing of the Australian population poses a serious issue for the future supply and demand of informal care in Australia.

Delayed Childbearing

The second demographic trend likely to impact the supply and demand for care in Australia is delayed childbearing. Since the 1970s, Australian women and men have been having children at later ages. Australian Bureau of Statistics data on births show that the median age of childbirth for all mothers in Australia in 2015 was 31 years old, for fathers it was 33.1 years (Australian Bureau of Statistics 2016a). Looking back to 1975 shows that this has increased significantly; the median age of childbirth in 1975 for mothers was 25.8 years, for fathers it was 28.6 years (Australian Bureau of Statistics 2016a).

Delayed childbearing is likely to impact caring needs and the ability to meet them in a number of ways. Firstly, delayed childbearing has implications for the total fertility rate. Childbearing delayed can often mean child births denied altogether as some will delay their childbearing to the point that cannot easily fall pregnant, resulting in not having any children at all or reducing the number of overall children they have (Rowe 2006, Balasch and Gratacos

2012). As a result, delayed childbearing plays a role in overall fertility rate reductions (Qu, Weston et al. 2000, Vaus 2002a).

Reduced total fertility rates are well documented in Australia. In 2015 the total fertility rate was 1.81 births per woman, which is below replacement levels (Australian Bureau of Statistics 2016a). This is a significant reduction over the last few decades; at the beginning of the 1960s the total fertility rate was 3.5 births per woman (Australian Bureau of Statistics 2016a). It must be noted here that the overall decline of the total fertility rate is due to many factors and not just delayed childbearing. Other factors driving the overall reduction in fertility rates include improved access to reliable contraception and increased female labour force participation (Qu, Weston et al. 2000, Vaus 2002a). However, delayed childbearing has contributed to the total fertility rate and is likely to continue to do so. Through the lowering of the total fertility rate, delayed childbearing contributes to population ageing, which has been shown to impact supply and demand of care in Australia.

Delayed childbearing not only contributes to population ageing on the whole (and the issues it brings for the provision of care outlined above), it also has the potential to change the structure of Australian families. Advanced maternal age at first birth is a significant predictor of the likelihood of not having a second birth (Parr 2007). The low total fertility rate described above confirms that Australians are having significantly less children than they have in the past. This means that within individual families, there will be fewer children and grandchildren in the younger generations present to provide care to older generations in increasingly 'top heavy' family structures. With fewer siblings present to share the caring responsibilities for the older generation, the load of caring for individuals could increase significantly.

In addition to its implications for the supply of care, delayed childbearing can also have direct impacts on the demand for care in Australia. Having children later in life, especially for women (referred to as advanced maternal age) is

associated with adverse effects – it increases the risks of the child having disabilities or long-term health issues (Tough, Newburn-Cook et al. 2002, Joeseph, Allen et al. 2005, Johnson and Tough 2012). Increased delayed childbearing therefore has the ability to directly impact care needs by increasing the number of children requiring additional care.

Conversely, delayed childbearing could theoretically reduce the demand for care. The idea being that it results in less children in each family requiring care. While a logical argument on the surface, there are some counterpoints which require challenge this view. Firstly, additional children do not add into 'parenting hours' in a linear fashion. In other words, the increase in time spent parenting four children may not be much more than the time spent caring for three children. This is due to parents performing additional child care activities alongside existing one and other household activities (Craig and Bittman 2008). Therefore, families having fewer children due to delayed childbearing may not necessarily substantively reduce the time spent caring for children. Secondly, studies have suggested that contemporary parents invest more time caring for their children than parents of previous generation did (Craig 2007). This could mean that even accounting for less children overall, the demand for (and demands of) child care may remain or even increase.

Delayed childbearing also has potential impacts specific to dual care. If Australians have children later in life, they may increase the possibility that they will still have young children when their own parents become frail aged. Not only do they then increase the chance that they could become dual carers, they could also reduce the chance that their own parents will be alive and able to support them in the form of informal child care.

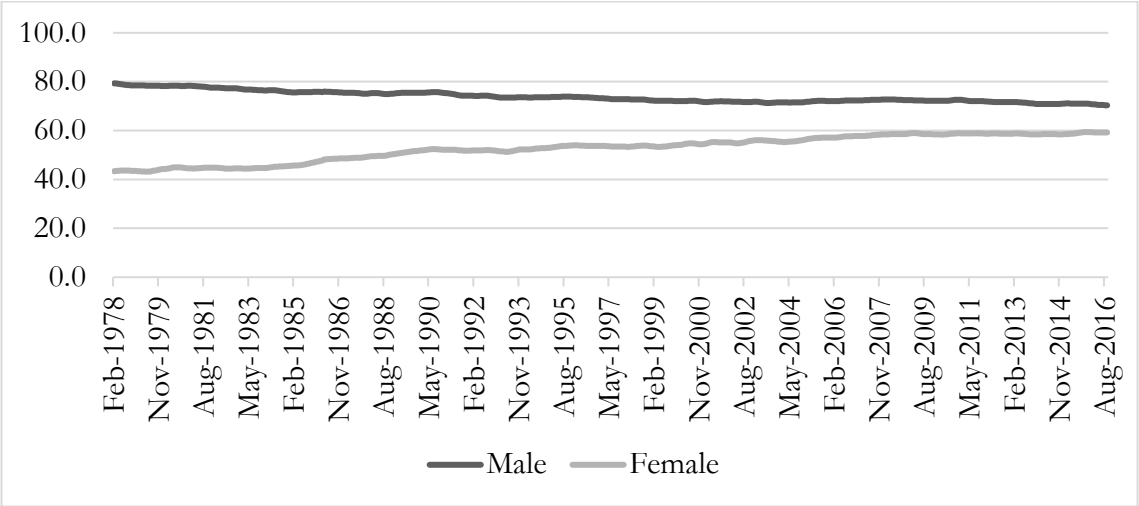
Increased female labour force participation

Increasing female labour force participation is a demographic trend that has already had demonstrable impacts on the provision of care in Australia, and is

likely to continue to do so. Like delayed childbearing, increased female labour force participation both contributes to the demographic trends outlined above, as well as having its own unique impacts on the supply of care in Australia.

The rise of women in the Australian workforce over the last few decades is well documented. Figure 1.1 clearly illustrates the increased labour force participation of women from 1978 to 2016.

Figure 1.1 Australian labour force participation rates 1978-2016, by sex



Source: ABS, 2016, 6202.0 - Labour Force, Australia, Time series spreadsheets

Although the increase illustrated in Figure 1.1 appears to have levelled off over more recent years, other data from the ABS show that the trend continues. Specifically, for those aged 20 to 74, female labour force participation grew from 61.1 per cent in 2002, to 66 per cent in 2015 (Australian Bureau of Statistics 2013h, Australian Bureau of Statistics 2016d). Although the growth to date has been substantial, there is certainly still room for further increases in female labour force participation. This is particularly apparent when differences between men and women in work hours is taken into consideration. Australian women are still significantly less engaged in the labour force then men; in the 2015-2016 financial year, 44 per cent of

employed women were in part-time employment, compared to only 14 per cent of employed men (Australian Bureau of Statistics 2016d). The over-representation of women in part-time employment is strongly associated with the presence of young children in the home (Evans and Kelley 2008). Should those women working part-time and providing unpaid child care to their own children increase their labour force participation, this will undoubtedly reduce the supply of informal child care from mothers, thus increasing the demand for care provided by others (either formally or informally). In addition to younger women more actively participating in the workforce, the increased labour force participation of older Australian women is also relevant to the supply of informal carers. According to the ABS Labour Force Survey (2017), from 2006-07 to 2016-17 the labour force participation rate for women aged 60-64 increased by 16 per cent, from 34 to 50 per cent. This was the biggest increase for any group over that period of time. As will be demonstrated in later chapters, grandparents (grandmothers specifically) provide the most informal child care outside of parents. Increasing labour force participation of this age group is likely to have a direct impact on the supply of that care.

Engagement in part-time employment, as well as being out of the labour force is also associated with the provision of informal care outside of child care (Gray, Edwards et al. 2008, Watts 2010, Nguyen and Connelley 2014). Given Australia's reliance on those who are out of the labour force or employed part-time to fulfil our informal care and child care demands, a continuation of the trend of increased female labour force participation raises serious concerns about the ability of Australia to meet its future caring needs (Jenkins, Rowland et al. 2003).

In addition to the direct ways in which increased female labour force participation affects the provision of and need for care, there are also indirect impacts. These indirect impacts are via contributions to the other demographic trends already discussed. Specifically, increased female labour

force participation plays a key role in the delayed childbearing, and the lowering of Australia's total fertility rates (Vaus 2002a). These two trends alone have previously been shown to be relevant to the supply and demand for care in Australia; they also demonstrably contribute to the ageing of the population.

The obesity epidemic

The final potential factor changing caring needs and the ability to meet those needs is the obesity epidemic. Like delayed childbirth and the ageing of the population, the obesity epidemic has the potential to increase the demand for care. The previous sections of this chapter are largely based on the argument that the demand for care is driven by the number and proportion of Australians who are frail aged, have long-term health problems or have disabilities. Howe and Schofield (1996: 5) would agree with this assertion; they explain that "the underlying determinant of the need for care is the level of disability in the community". Growing rates of overweight and obesity could impact the demand for care in Australia by increasing the number and proportion of Australians with disabilities and long-term health issues.

The most recent data available from the Australian Health Survey (renamed the National Health Survey) show that the percentage of Australians who are overweight or obese has grown significantly; from 56.3 per cent in 1995, to 63.4 per cent in 2014-15 (Australian Bureau of Statistics 2013k, Australian Bureau of Statistics 2015d).

Being obese in itself can be a reason people require care, but more importantly, obesity is the cause of a number of serious health problems which can result in the need for care. The risks of being overweight or obese are well established in the medical research community. These risks include, but are not limited to; type 2 diabetes, cardiovascular disease, high blood pressure, various musculoskeletal conditions and cancers, depression, and the

restriction of the management of other chronic conditions (Visscher and Seidell 2001, Mokdad, Ford et al. 2003, Onyike, Crum et al. 2003, Wang, McPherson et al. 2011). The potential impact of overweight and obesity on Australians' demand for care is clearly demonstrated in the World Health Organisation's (WHO) Global Burden of Disease study. The GBD (2010) study concludes that high body mass index is the second biggest contributor to the burden of disease in the Australasia region. In second place, it is thought to be a larger contribution to the burden of disease than smoking. It is a logical conclusion, therefore, that as the number of obese people increases, the need for care due to obesity related diseases will also increase.

It is in this context of an ageing population, with delayed childbirth, increasing female labour participation and increasing rates of obesity that the research of this thesis takes place. All four factors play a key role in determining both the levels of care Australians demand, and the level of care Australians are able to provide informally. With these factors in mind, the most likely future is one with significantly increased demands for care, but reduced ability to fulfil those needs.

Why is dual care important?

The previous section outlined the context of care in Australia, showing the ways in which Australia's care needs are likely to increase, and demonstrating that our ability to meet those care needs is likely to decrease.

Dual carers are at the fore front of meeting caring needs. They provide both informal care to someone who is frail aged, has a long-term illness or disability *as well* as providing child care. Dual carers, like care in general, are likely to be both more in demand and less available as time goes on.

In order to fully appreciate the importance of dual care to Australian society, one must first understand the importance of informal care and child care

separately. The provision of informal care by Australia's 2.7 million informal carers has far reaching effects, beyond those individuals who provide and receive care. The most obvious is the significant economic value to Australian society. The economic value of informal care in Australia is estimated to be $60.3 billion per annum in terms of replacement value, which is what it would cost to formally replace the unpaid work done by informal carers. (Deloitte Access Economics 2015). This is approximately 3.8 per cent of the Gross Domestic Product (GDP) for 2015. This significant contribution made by carers to their families, communities and Australia as a whole must not be understated.

It is crucial to develop a full understanding of dual care because it is this knowledge that will allow Australia to face the increasing care demands of its population. The cost of neglecting this knowledge will be a serious reduction in the ability of our society to meet its caring needs. Determining the predictors of dual care will allow us to identify and support people who become dual carers. Identifying the impacts of dual care will permit us to prevent or mitigate the negative impacts, which have costs to society of their own and also decrease caring.

The gap in the existing research

The gap in the existing research will be presented in greater detail in the literature review sections of this thesis. However, it is still useful to summarize it here as it forms part of the rationale for undertaking the research.

It has so far been established that Australia needs to understand what predicts care and what the impacts of care are. To a certain extent, we already know this. Specifically, we know what characteristics make people more likely to take on informal caring responsibilities, and we have a general understanding of the impacts of that decision. We also understand the characteristics that

make Australians more likely to take on caring responsibilities of children, and again we know what the impacts of providing child care are.

What we ***do not know*** is what characteristics make people more likely to take on both an informal caring responsibility and child care responsibility. We ***do not know*** what the impacts of combining these two types of caring responsibilities are. In other words, we do not know what the predictors of dual caring are, nor do we know what the impacts of dual caring are.

There is also a small body of Australian research that addresses those with increased caring responsibilities. Much of this literature refers to the 'sandwich generation', amongst other terms. This literature, as well as the reasons those terms are not adequate in this research are fully explored in later chapters. There is still a very significant amount of knowledge regarding care in Australia.

This thesis makes an original contribution to knowledge by examining dual caring in Australia, and presenting and analysing the predictors and impacts of providing dual care.

The research questions

A clear statement of the research aims and questions is an essential component of any thesis introduction. Accordingly, this section presents and defines the aims and questions of this research.

The overarching research aim of this thesis is to establish whether or not dual carers are different from the rest of the Australian population, and if so, how are they different? This general research aim can be focused into two specific research questions. These questions are:

1. What are the predictors of dual care, and how are they different from the predictors of other caring behaviours?

2. What are the impacts of dual care, and how are they different from the impacts of other caring behaviours?

Each key research question proposed here benefits from some unpacking. The first key question, regarding the predictors of dual care, is essentially asking if there are specific characteristics which increase the likelihood of Australians taking on a dual care responsibility. These characteristics could include a wide range of individual traits, such as being female, belonging to a certain age group, being employed part-time and so on. This question then goes further and asks if those characteristics which predict dual care are unique from the characteristics which make Australians more likely to provide other types of care, specifically informal care or child care.

The second research question asks what the impacts of dual care are. This question aims to identify how becoming a dual carer effects a wide range of other areas. The kinds of areas which the provision of dual care could impact include (but are certainly not limited to) physical and mental health, employment status or life satisfaction. In addition to identifying the ways in which dual care impacts the lives of dual carers, this research question asks if the impacts of dual care are the same as, or different from the impacts of the provision of informal caring responsibilities, child care responsibilities, or no caring responsibilities at all.

Answering these specific research questions, as well as addressing the overarching aim of the thesis takes place within every chapter. The following outline of the thesis demonstrates exactly how each chapter contributes to answering the research questions, thus furthering the aim of the thesis as a whole. In addition to this, the following section provides a guide for reference regarding the purpose and general contents of each individual chapter.

Outline of the thesis

Chapter One: Introduction

The first and current chapter of this thesis, the aim of the introduction is to introduce the reader to the research. The primary purpose of this chapter is to clearly introduce the aims and research questions of the thesis, and show how the research intends to answer those questions. The introduction begins by providing the thesis statement, presenting the context of dual care in Australia and illustrating why dual care is an important topic. The introduction points towards the gap in the existing literature and shows how the research questions of the thesis address this gap in knowledge. Finally, the introduction chapter offers an outline of the structure of the thesis comprised of brief synopses of each individual chapter.

Chapter Two: The concept of care

Chapter Two is the first of two separate literature review chapters. The purpose of this chapter is to situate the reader within the concept of care, and provide an understanding of what care is. This begins with a general, abstract theory of care, then proceeds to a more detailed and practical level. As well as exploring and assessing competing theoretical concepts of care, this chapter provides the definitions of the key terms of the thesis. This primarily involves defining the types of caregiving to be examined in the thesis; informal care, child care and dual care.

Chapter Three: The known predictors and impacts of care

This is the second literature review chapter. Its purpose is to present the existing literature regarding the predictors and impacts of informal care and child care, and speculate what this might mean for dual care. In examining this

literature, this chapter explores and critiques what is already known about the provision of care in Australia.

Chapter Three begins with an illustration of the current state of informal care in Australia. The predictors of providing informal care are then examined, followed by the impacts of providing informal care. The known predictors and impacts of providing child care are then presented. The very small body of Australian research regarding increased caring responsibilities is examined, this clearly illustrates the significant gap in the literature regarding the predictors and impacts of dual care. The chapter concludes with speculation and theories about what the existing literature implies for dual carers.

Chapter Four: Data

The primary purpose of Chapter Four is the description of the data used in the thesis. This involves discussion of the two key data sets used; the Household, Income and Labour Dynamics in Australia (HILDA) survey, and Australian Census data. The benefits and limitations of each data set are investigated and key variables are described and provided with operational definitions alongside relevant information about variable construction.

Chapter Four also briefly introduces the principal methods of analysis; descriptive analysis, event-history analysis and multilevel modelling. The benefits and limitations of those methodological techniques are also presented. This brief introduction of methods is followed by in depth examinations in the corresponding results chapters.

Chapter Five: Illustrating dual care in Australia

Chapter Five is the first of the substantive results chapters. The results presented in this chapter address the overarching aim of the thesis, showing that those who provide dual care are significantly different to the rest of the Australian population, without making statements about causality. The

purpose of Chapter Five is therefore to illustrate dual care in Australia, and demonstrate the ways in which it differs from informal care, child care and no caring responsibilities. This is achieved by presenting descriptive and cross sectional analyses from Census and HILDA data. In addition to illuminating the differences inherent in the provision of dual care, this chapter also explores spells (length of time) of dual caring, and the common entries to dual care.

Chapter Six: The predictors of dual care

Chapter Six answers the first of key research questions of the thesis. The characteristics that increase the likelihood of providing dual care, as well as those that determine the hazard of providing informal care and child care are investigated in this chapter through the use of event-history analysis, specifically discrete time hazard models.

The chapter begins with an in-depth examination of the methodology of event-history analysis, then presents the results of the discrete-time hazard models, clearly demonstrating that there are significant and unique characteristics which predict the hazard of providing dual care.

In addition to demonstrating the predictors of dual care, and showing that those predictors are different for the provision of informal care and child care separately, this chapter discusses the results and offers some explanations as to why certain characteristics predict (or fail to predict) the provision of care the way they do.

Chapter Seven: The impacts of dual care

Chapter Seven addresses the second key research question, illustrating the impacts of dual caring, and demonstrating that those impacts are significantly different to the impacts of providing informal care or child care alone. The impacts of dual caring are identified, then compared and contrasted to the

impacts of informal care and child care through the use of multilevel modelling.

Chapter Seven commences with the presentation of the detailed methodology of the multilevel model approach. It goes on to demonstrate that there are significant impacts stemming from the provision of dual care, and confirms that these impacts are substantively different from the impacts of providing informal care or child care (or not providing any care at all). The implications of the identified impacts of care are discussed with particular attention paid to the way they relate to the relevant theories explored in the literature review.

Chapter Eight: Conclusion

Chapter Eight is the final chapter of the thesis. The purpose of the conclusion is to clearly and concisely summarize the findings of the thesis, and show how the original research questions have been answered. This chapter shows how the research conducted has addressed the gap in the literature, and outlines the contribution to knowledge that it has made. The implications of the findings of the research are discussed and opportunities for further research are stated.

Conclusion

Dual carers provide a valuable service to Australian society. By combining informal care responsibilities with child care responsibilities, they are at the fore front of meeting the caring needs of the country. In spite of this, as a group they have not been addressed by existing research. This thesis fills the current gap in knowledge surrounding dual care in Australia. It constitutes an original contribution to knowledge by presenting and analysing the predictors and impacts of providing dual care in Australia.

Chapter Two: The Concept of Care

Introduction

The concept of care is not a simple or straightforward concept. Indeed, Daly and Lewis (2000: 284) state that "for all it is widely used, care is both ambiguous and contested". As such, this chapter will provide a thorough explanation of what 'care' is. It is the first of the two literature review chapters, and its primary purposes are to situate the research presented later in the thesis, and provide detailed definitions of the most important terms.

This chapter begins with the etymology of the word care itself, showing from the very beginning the dichotomous nature of our understanding of care. These varied definitions of care have grown into an understanding of care as a social interaction, and this understanding will be explained and critiqued. The final aspect of the general concept of care to be studied in this chapter is the five levels of differentiation of caregiving. The discussion of the differentiating levels of caregiving allows us to move on to the specific definitions of types of care discussed throughout the rest of the thesis. These are informal care (referred to sometimes as single care), child care and dual care.

The etymology of care

The complexities of the concept of care begin at the root of the word itself. Fine (2004, 2007) offers a comprehensive examination of the concept of care, and finds that historically, caring has two conflicting sets of meanings. The first, derived from the Latin '*caritas*' gives the idea of care as 'love' and 'charity', while the second, derived from '*cura'* portrays care as 'worry', 'concern' and 'responsibility' (Fine 2007: 27-29). Both of these meanings, although different, present themselves throughout the following discussion of

the modern understanding of the concept of care. Before examining those more specific definitions of care, it is useful to think about care at its most encompassing and general level. At this very general, conceptual level, Fisher and Tronto offer a useful definition of care as a 'species activity':

"Caring can be viewed as a species activity that includes everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible. That world includes our bodies, our selves and our environment, all of which we seek to interweave in a complex, life sustaining web." (Fisher and Tronto 1990: 40)

The term 'species activity' is a philosophical description deliberately used by the authors to propose that the way in which "people care for one another is one of the features that make people human"(Tronto 2001). It emphasises that caring is an activity participated in by humanity as a whole, and that it is fundamentally crucial to our survival and wellbeing. Not only do all humans participate in some way in providing care (using this general definition), all humans are certainly recipients of it at least at some points in their lives, if not their entire lives. At this level, care is the building block for the continuation of human life itself.

The dichotomous nature of care

Understanding care at this general level is crucial as it demonstrates the enormous significance of care. However, a more specific and detailed understanding of the complexities of care is necessary to analyse and deal with caring at a more practical level. Towards a more practical understanding of care, Graham (1983) offers a distinction within care that has come to be central to most recent examinations of care. Graham (1983) suggests that caring can be separated into two components; *caring about* and *caring for*. The first of these understandings, *caring about* refers to emotions and mental disposition. When someone cares in this sense of the word, they have a

concern for someone or something else. *Caring for* on the other hand, signifies an activity or a form of work that provides assistance for another. Although it is tempting to try to apply Graham's differentiation of care to the previously outlined etymology of the world (*cura* and *caratis*) the two dual concepts do not line up neatly. The idea of love and charity (*caratis*) at first appear to sync with the emotions and mental disposition of *caring about,* however charity brings with it the idea of action, with also aligns with *caring for*. Worry and concern (from *cura*) also seem to correspond with the emotional and metal disposition of *caring about*, whereas the implied action of responsibility is a better fit with *caring for*. Although Graham's dichotomy of care does not align with dichotomy of the etymology of care, the concept still has much relevance for other understanding of care. This relevance will be demonstrated throughout this chapter.

Care as a social interaction

Tronto (Fisher and Tronto 1990, Tronto 1993, Tronto 2001) takes Graham's dichotomy of care and expands it to a four step process. These four phases are as follows:

1. Caring about. This is the first phase of caring, it involves being aware of and paying attention to the need for caring.
2. Caring for. In the second phase of caring, a person takes responsibility for the need for care. This also includes the organisation or planning of caring.
3. Caregiving. In this phase of caring, the need for care is actually met. It involves individuals and organisations carrying out the tasks of caring.
4. Care receiving. The final phase of caring is the response of the entity receiving the care.

While the first two steps in Tronto's process of care are very similar to the two types of care outlined by Graham, steps three and four present a very

different aspect of caring; the social interaction between the care provider and recipient. Tronoto is not the only author in the field to focus on social interaction within caring. Other researchers, such as Gilligan (1982), Bubeck (1995) and Daly and Lewis (2000) also stress the importance of care being a result of the interaction or relationship between individuals.

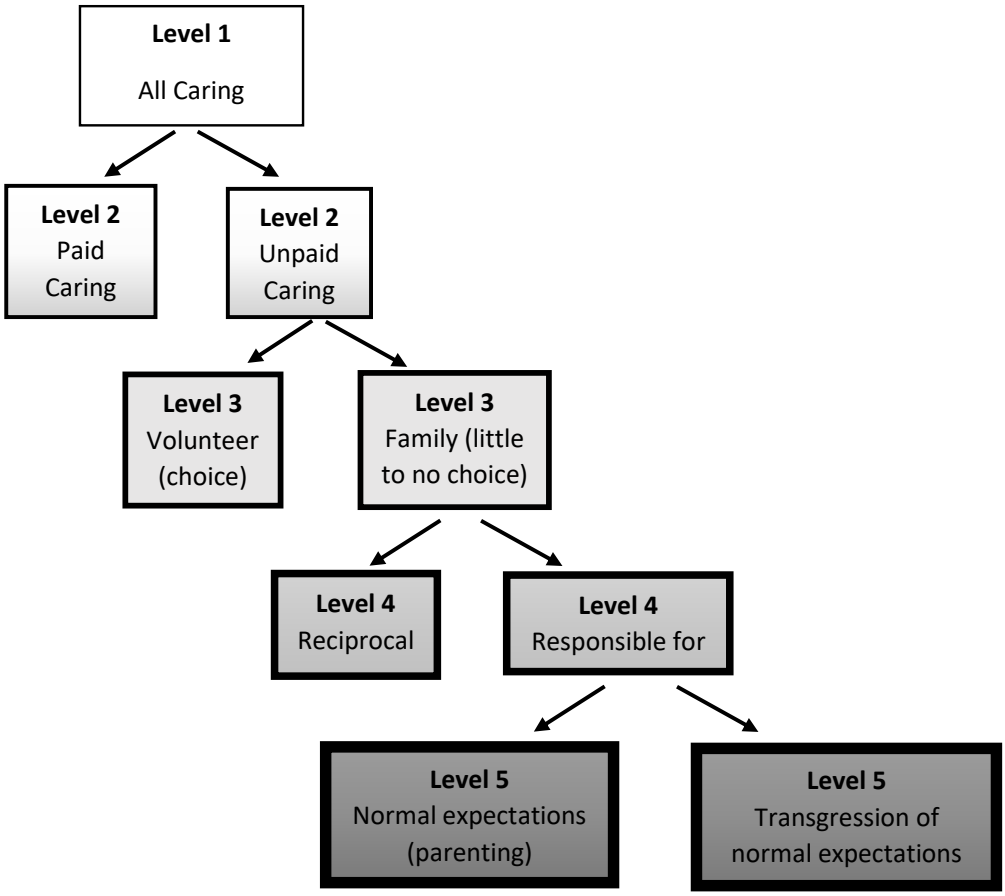
Due to the inclusion of the idea of care as a social interaction, Tronto's phases of care are a positive expansion on Graham's two-sided definition of care. However, this concept of care still has a number of issues, as outlined by Fine (2004, 2007). If all four phases are necessary components of caring, what of caring situations that are missing one or more steps? Fine (2004: 225) gives the example of the care of an unconscious person, unable to respond to care and thus perform phase four. Would this still be considered an example of care under Tronto's definition? More importantly, Fine (2007) argues that Tronto's phases of care are still based upon the carer-dependent paradigm which portrays care as initiated and controlled by the care givers, with the recipients of care behaving passively. Fine asserts that in Australia, care is still generally understood through this 'carer-dependent' model or paradigm of care, where care is seen as "a private, individual concern, as a one way activity in which the active agent, the carer, does something to the other, passive, recipient" (Fine 2004: 220). Therefore, Fine asks us to remember that care is 'a complex cluster of social activities, behaviours and dispositions' and argues that it is crucial that the concept of care not be reduced to a simple action performed by carers on care recipients. It is with this warning in mind that the closer examination of care continues, and the placement of different types of care within the broad category of 'care' can be made.

Five levels of differentiation

Schofield et al (1998) provide a detailed definition and differentiation of caring in their discussion of 'family caregivers'. Their discussion of caring is

useful here in that it allows us to focus on exactly what types of caring are of interest to this thesis (and what types are not). Figure 2.1 illustrates their five separate levels of caring, with each level further distinguishing care.

Figure 2.1 Levels and differentiating factors in caring



Source: Schofield et al, 1998. Family Caregivers: Disability, Illness and Ageing

In examining Schofield et al's conceptualisation of care, we begin with level one, the broadest level which includes all people who provide care. This level of care refers to the previously discussed idea of care as a broad 'species activity' from Fisher and Tronto (1990). It includes the myriad of ways in which humans care for each other. The differentiation of types of care begins at level two, where carers are divided by separating professional carers (those who are paid for their caring activities) from other unpaid carers. In other words, at level two, carers are divided into those who receive monetary remuneration for the care they provide, and those who do not. This separation between paid and unpaid care is sometimes referred to as formal

and informal care, with paid care equated to formal care, and unpaid care to informal care. However, this naming comparison is not completely appropriate as there are people who provide care in a formal setting who are not paid. These are volunteers who provide care through formal organisations. Although formal unpaid (volunteer) carers do not fit in neatly to the formal/informal paid/unpaid comparison, they are accounted for in the following level of Schofield et al's levels of care.

Unpaid carers are further differentiated at level three into those who chose to provide care (volunteer carers) and those who would have little to no choice because of the close ties they have to the recipient of their care (family carers). Schofield et al describe the distinction between these two group as the presence (or absence) of choice in caring responsibilities. This distinction may be problematic. Although many people providing care to a family member may feel that they had no choice in taking up their caring responsibilities, there must also be many who do feel that they have a choice, and they choose to provide care. Claiming that family caregivers have no agency in regards to their caring is an issue firstly because it simply does not describe the reality of caring experienced by many carers. Secondly, by denying the choices of caregiver to provide, one falls into the trap of reducing complex caring relationships to less than they actually are.

Level four illustrates that family carers can be in a reciprocal caring relationship in which both people perform caring activities for one another with mutual dependence, or the dependence can be imbalanced, meaning the carer is responsible for the recipient of their care. To give an example of a reciprocal caring relationship, one might think of an elderly couple who, due to old age, have different areas in which they require assistance. Each person, at different times and for different activities would be assisting the other, resulting in a reciprocal caring relationship. An imbalanced caring relationship may occur when a parent provides day to day care for a child with disabilities,

the child in this scenario would be unlikely to be performing caring activities for the parent, meaning the parent is responsible for the child. Once again, at this level the warnings of Fine regarding the reduction of complex relationships are pertinent. Even in cases where the majority of caring activities are performed by one person for the other, there is generally still give and take in caring relationships which goes in both directions. It is crucial that this social complexity is acknowledged.

The final level of Schofield et al's schema of caring distinguishes between carers who are responsible for the recipient of their care into two more types of care. In level five we see the division of care typically provided to children by parents (parenting or child care) and care which transgresses 'normal' expectations. Parenting care (or child care) here refers to the care of children who *do not* have any special needs, disabilities or long term health problems. This is the type of care that one would typically expect a child to require. It can also be provided by individuals other than the child's parents (grandparents for example). The care of children *with* special needs, disabilities or long term health problems would fall into the second category of level five; care which transgresses 'normal' expectations. This type of care involves "being responsible for that person beyond what might customarily be expected of that relationship" (Schofield, Bloch et al. 1998: 10). The care of a child with special needs or a disability can differ to customary child rearing in the type of assistance required, the intensity of the assistance and the expected duration. Care that transgress expectations is not limited to care for children. Another example of care which transgress 'normal' expectations is the reversal of the child parent relationship, when the (usually adult) child finds themselves performing caring tasks for the parent that may have been traditionally performed by the parent for the (former) child. Essentially, it is they type of care that one would *not typically* expect to provide given the relationship and in the absence of disabilities, long term health problems or being frail aged. This type of care can occur in a wide variety of relationships,

including (but not limited to) caring for a spouse, a sibling, other family member, a friend or neighbour. It should be noted here that Schofield et al's approach in regards to care which transgresses normal expectations is specific to developed Western societies (such as Australia). This means that while the approach is relevant to Australia, in countries where elder care is part of normal expectations the distinction of this level of care would not be applicable.

Schofield et al's levels of caring offer a useful practical guide to understanding some of the nuances of care, however there are some areas which should not be used without further clarification. Specifically, it must be stressed that care which falls under the 'responsible for' category does not necessarily mean that the care recipient is passively dependent on the care provider. Stating the difference in level four between reciprocal care and 'responsible for' care is necessary to differentiate between acts of caring that routinely happen in relationships regardless of either party's health, age or disabilities; and acts of caring where one party needs assistance because of long term health problems, disability or being frail aged. However, it is crucial that this attempt to delineate types of care does not lead to overstating the dependency of care recipients. Portraying people as nothing more than the passive recipient of the act of care clearly denies the complexities of human relationships. Indeed, many people are reluctant to self-identify as 'carers'(Fine 2004, House of Representatives Standing Committee on Family 2009); first and foremost, they are husbands, wives, parents, siblings, friends, children. Regardless of health problems, disabilities or being frail aged there is almost always a level of give and take in human relationships, and reducing a social interaction such as caring to an act done by the active carer to a passive recipient is inherently problematic. Rather, care must be recognised as a complex social interaction in which both parties are active participants (Fine 2004).

The two types of care found in level five are the foundation and main focus of this thesis. For the sake of clarity, care which transgresses 'normal' expectations will be referred to as informal care. The providers of informal care will be referred to as informal carers. Care provided to children which falls under the title 'parenting' (care within normal expectations) will generally be referred to as child care. Parenting will not be used as the general term because it implies the exclusion of other non-parents who provide unpaid informal child care (such as grandparents). People who combine these two types of care will be referred to as dual carers. With these general concepts of care in mind, the specific and practical definitions of informal care, child care and dual care as they are used throughout the thesis will be now outlined.

Defining informal care

Informal care has so far been situated within the wider framework of the concept of care, and the levels of caring. Within this context, a working definition of informal care can be arrived at. This will be accomplished through an examination of the specific definitions most commonly used in Australia, and an examination of the particular caring activities that can be performed in a caring relationship.

There is a clear level of consensus in Australia on what informal care is, with various Australian organisations and researchers using similar variations of the same definition. Savage and Bailey (2004a) provide a useful starting point in defining informal care. They state that informal care occurs when "an individual (often a relative or friend) provides unpaid assistance to a care recipient, who is unable to perform day to day tasks unaided due to disabilities, long term health problems or being frail aged" (Savage and Bailey 2004b: 111). Informal care does not include care that occurs within an institution or care that is paid for (even if it is paid for by someone other than the recipient of the care). In other words, informal care is provided free of

charge and outside of the boundaries of formal government provision (Access Economics 2010).

In a similar vein, The Australian Bureau of Statistics defines informal care as the provision of "informal assistance to people with disabilities, long term health problems or older people" In the Survey of Disability, Ageing and Carers (SDAC), the ABS also requires that the assistance be ongoing, or likely to be ongoing for at least 6 months (Australian Bureau of Statistics 2013l). Carers Australia, a prominent carer's advocacy group, are slightly more inclusive in their definition of carers, stating that carers provide "unpaid care and support to family members and friends who have a disability, mental illness, chronic condition, terminal illness, an alcohol or other drug issue or who are frail aged" (Carers Australia 2014). Researchers Cummins et al (2007: 1) also provide a very similar definition, stating that "carers are usually family members who provide support to children or adults who have a disability, mental illness, chronic condition or who are frail aged. Carers can be parents, partners, brothers, sisters, friends or children." All of these definitions refer overtly or otherwise to the second part of Graham's dichotomy of care, the *caring for* component. The assistance, help or support provided by informal carers is crucial (and attractive) to researchers because the activities of caring are measurable and quantifiable.

Informal caring activities

Given that the all the aforementioned definitions of informal care focus on the act of caring, it is appropriate to actually examine the specific activities that shape informal care. Informal caring covers a wide range of activities, and the people who provide informal care undergo complex and variable experiences. The varied ways in which people provide and experience care, amplifies the importance of clearly defining and differentiating various caring activities.

Just as there is a general consensus of standard definitions of informal care in Australia, there is also broad agreement on what activities constitute informal care. Firstly, it has been stated that informal caring involves providing assistance with tasks. Although this hints at what activities carers might perform, it certainly does not give a full understanding of the wide variety of ways in which carers provide informal care. Given that the ABS is the primary collector of data regarding caring in Australia, their list of caring activities is a good place to begin. The activities considered by the ABS to be areas in which carers provide assistance are as follows; self-care, mobility, communication, cognition or emotion, health care, reading or writing, transport, household chores, property maintenance and meal preparation (Australian Bureau of Statistics 2013f). Braithwaite (1990) offers a similar list, acknowledging help with cleaning, shopping, meal preparation, and self-care (washing, dressing, toileting and mobility), but also includes supervisory care (in which regular well-being checks are made) as caring activities.

Schofield et al (Schofield, Bloch et al. 1998) differentiate the activities in which assistance is needed into two groups; *physical* activities of daily living (ADLs) and *instrumental* activities of daily living (IADLs). The physical activities include; getting in and out of bed, using the toilet, dressing, moving about, bathing/showering, eating, and incontinence. The instrumental activities include organising social services, managing money, communicating, and medication use. Given that carers could be participating in any number or combination of these activities, the wide range of potential caring activities supports the idea that caring relationships can be widely variable.

Primary vs secondary care

One common attempt to differentiate carers (and quantify their caring activities) is the distinction between primary and secondary carers. Although the majority of this thesis will not divide carers into these two groups, they are classifications which are commonly used and therefore must be addressed

here. The ABS defines primary carers as "someone who provides the most informal assistance to a person with disability with one or more of the core activities of mobility, self-care and communication" (Australian Bureau of Statistics 2013g). The SDAC also only considers persons aged 15 and above as eligible to be primary carers. Secondary carers can therefore be understood as informal carers in the definitions previously outlined, there just happens to be another carer (the primary carer) who provides more care to the person requiring assistance. Given that a primary carer provides the most care to a care recipient; a person who requires assistance can only have one primary carer, but could theoretically have a number of secondary carers. Differentiating between primary and secondary carers can be useful in that it may provide a quick way for researchers to examine the effects of intensity of caring, given that primary carers would generally spend more hours caring in often more demanding caring activities than secondary carers (Nguyen and Connelley 2014). However, the primary/secondary carer spilt is also problematic in that the focus of research tends to gravitate towards primary carers to the exclusion of secondary carers (who are often other family members) (Edwards, Higgins et al. 2008).

Informal vs formal care

The division between formal and informal care has already been touched upon during the discussion of Schofields' five levels of care. However, it is still worthwhile to clearly reiterate the differences between these types of care. For people who require assistance with day to day activities, due to long term health problems, disabilities or being frail aged, care can be provided formally or informally. Formal care provision is generally from an organisational source and is often, but not always paid for (and not necessarily paid by the recipient of the care). Informal care is not paid for (excluding carer's allowances or pensions), and is generally provided by someone with a close relationship to the recipient. The Australian Institute of Health and Welfare (AIHW)

provides a useful differentiation between informal and formal care, stating that the adjective 'informal' is "a means of distinguishing the unpaid care provided by family, friends or neighbours from care provided by formal agencies or institutions, paid for by the receiver (possibly including government subsidies), or provided by (necessarily) trained professionals." (Australian Institute of Health and Welfare 2016) The AIHW also stresses that title 'informal care' does *not* imply that the care provided is thought to be casual or otherwise less than or inferior to formal care.

The general consensus of the definitions examined thus far implies that idea of informal care is fairly straightforward. The previous discussion of the concept of care showed that this is not the case, and informal care must be understood in the wider context of care; as a species activity, with a dichotomous nature, as part of a social interaction, and with complex levels of differentiation. Keeping in mind this discussion, the simple, working definition of informal carers is as follows;

A working definition of informal care

Informal carers are people who provide unpaid assistance to one or more recipients experiencing difficulty due to disabilities, long term health problems or being frail aged.

In the later chapters of this thesis, informal carers are occasionally referred to as single carers. This is to differentiate them from dual carers, and means that they only have an informal caring responsibility and no additional child care responsibilities.

Given that this thesis uses two data sources, there are minor differences in the operational definition of informal care, depending on the data used. These differences (and their implications for analysis) are outlined in Chapter Four - Data.

Defining Child Care

Now that informal care has been clearly defined, it is time to present a definition of child care and situate it within the wider framework of the concept of care, and the levels of caring. The discussion of child care begins with the differentiation between formal and informal child care. Child care is then (once again) situated within Schofield et al's levels of caring, illustrating both how child care links to, and is different from the previously discussed care. The activities of child care are also outlined, followed by a working definition of what child care means in this thesis.

Informal vs. formal child care

The term 'child care' generally brings with it notions of formally provided child care. However, this research refers to child care as the unpaid and informal provision of care to children. The Australian Bureau of Statistics (2015b) provides a useful differentiation of formal and informal child care, as follows:

"**Formal care** is regulated care away from the child's home and includes attendance at: a pre-school or kindergarten; a child care centre, long day care centre or family day care; a before or after school care program; other formal care arrangements such as occasional care in shopping centres etc."

"**Informal care** is non-regulated care either in the child's home or elsewhere. It includes care given by family members (such as the child's brothers or sisters, grandparents or other relatives), friends or neighbours, and paid baby sitters."

Within the Australian Bureau of Statistics' publications, and within Australian research in general, the term child care usually refers to care provided to children by people or organisations other than the child's parents. The care provided by parents to children is at times referred to as child care and

sometimes simply 'parenting'. This thesis refers to all informal child care provided to children as 'child care' regardless of who provides that care.

Child care situated in the five levels of care

Earlier in this chapter, informal care was situated within Schofield (et al)'s five levels of care (see Figure 2.1). Informal care was shown to be primarily located in level five, within the 'transgresses normal expectations' section. It was also stressed that informal care as is discussed throughout this thesis is also found within many of the other categories. For example, informal carers may not necessarily be family members with no choice, and care can be reciprocal within many informal caring relationships.

Situating child care is much more straightforward. Child care, as discussed in this research, is located in the other half of level five. It is 'responsible for' care which meets normal expectations. In other words, it is mostly parenting. Although the bulk of child care of interest here fits neatly into this definition, there are still two caveats that must be stated. Firstly, informal child care is generally, but *not always* performed by parents, or even immediate family. Grandparents in particular provide a significant amount of informal child care in Australia, and this care would generally fall into the 'responsible for' care that meets normal expectations. However, foster carers or close friends may also provide the level of informal child care that is the focus of this thesis. Therefore, child care can also, at times be situated at level three in the 'volunteer' section. Secondly, child care can sometimes be part of a reciprocal caring relationship. This dynamic is especially evident in the small number of informal carers aged below 15 who provide care to a parent. Indeed the 2012 Survey of Disability, Ageing and Carers identifies approximately 74,900 carers aged less than 15 years, roughly 2.8 per cent of all informal carers in Australia at that time (Australian Bureau of Statistics 2013g).

Child care activities

Just as informal caring involves a number of specific activities, so too does child care. Child care activities generally differ in a logical way by the age of the child/children in question, with the type, intensity and number of activities changing and often decreasing as the child ages. As a general definition of child care activities, the Australian Bureau of Statistics (Australian Bureau of Statistics 2006) offers the following: "A major activity classification group which relates to all activities done for children aged under 15 years. It contains activities such as the physical and emotional care of children, teaching, reprimanding, playing with and talking to children. It also includes minding children and visiting child care establishments or schools."

Lyn Craig has created a significant body of work exploring child care activities (specifically examining gender differences in who performs what kinds of activities). This work, and other research on the topic of gender differences in child care activities, is explored in more detail in the following chapter. However Craig and Jenkins (2016a) provide a useful summary of the kind of activities that child care generally involves, which is relevant here. They define four different types of child care activities; physical care, talk-based care, accompanying care, and minding care. Physical care involves hygiene tasks, feeding, dressing and putting children to bed. Talk-based care involves talking, listening, playing, reading and teaching. Accompanying activities include the transport of children, as well as meeting or waiting for them. Finally, minding activities revolve around the supervision of children. In other words, generally monitoring children without being actively involved in what they are doing (Craig and Jenkins 2016a).

These various child care activities are further defined by Craig and Jenkins into two primary types of child care activities: routine and non-routine. Routine activities are the ones which must be performed regularly and often (but not always) at the same time of day. Physical and accompanying care

activities usually fall into the routine category. Non-routine care activities are generally comprised of talk-based care and minding care and happen on a more ad hoc basis.

Multi-tasking / child care with secondary activities

Outside of the activities which are clearly 'child care' activities, there is a wide range of domestic work which surfaces or increases with the presence of children, but may not always be included in primary child care activity definitions. Domestic work activities in particular, such as cleaning, tidying, food preparation, laundry, shopping etc. may all be undertaken in childless households, but the presence of children can significantly increase the amount of domestic work that needs doing. Additionally, these domestic activities are often undertaken during child minding, meaning child carers are often multi-tasking, or undertaking both unpaid domestic work and child care at the same time (Australian Bureau of Statistics 2006). An example of child care as a secondary activity could be someone who is vacuuming the house whilst keeping an eye on children playing in the next room. Or someone preparing dinner for the family whilst helping a child complete their homework.

Craig and Bittman (2008) stress the importance of considering these secondary activities. They argue that "ignoring the time when child care is momentarily a background activity fails to acknowledge the constraining effects of responsibility for children" (Craig and Bittman 2008: 61). In other words, because undertaking domestic work in addition to child care requires presence and at least some attention from parents, it limits the scope of other activities they can do in that time. As such, domestic work must be considered when examining child care activities.

The brevity of the child care section of this chapter in comparison to the informal care section reflects the fact that the definition and understanding of parenting / informal child care is not as contentious as informal care. Even

so, to reach a working definition of child care it was still necessary to highlight the differences between formal and informal child care, to situate child care within the five levels of care, and to clearly outline the practical activities that constitute child care.

Keeping in mind this discussion, the simple, working definition of child carers in this thesis is as follows;

A working definition of child care

Child carers are people (generally parents) who provide regular, informal and unpaid care to one or more children aged 15 years or younger.

As was the case with informal care, due to the use of two different data sets the operational definition of child care differs depending on the data source in use. The differences between operational definitions for child care are more significant than the differences within informal care were. These differences are explained in detail in the data chapter. In both data sets a proxy is used for child care, which is also explained in detail in the data chapter. In each results chapter a reminder of the differences and their implications will also be provided.

Defining dual care

The final and most important definition to be addressed in this chapter is that of dual carers. This section is only a brief part of this chapter, but its brevity reflects only a lack of previous literature into the subject, rather than a lack of importance. Existing Australian literature rarely address those who provide dual care, and those that do, tend not to give them explicit names.

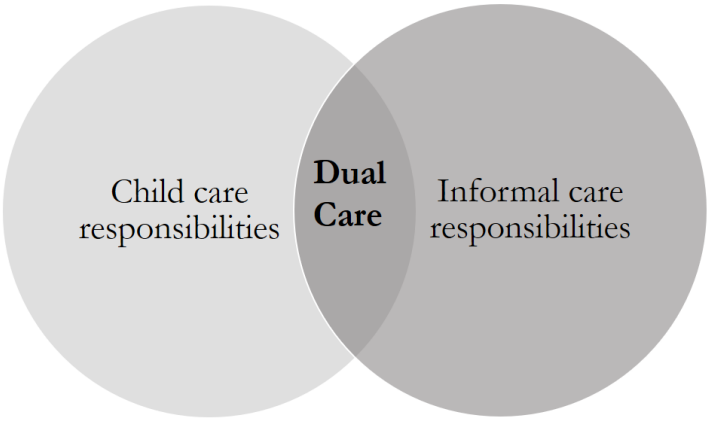
The basic definition of dual caring has already been presented in the introduction and abstract of this thesis as the combination of informal caring

responsibilities with other child care responsibilities. In its most simple definition, **dual carers combine informal caring responsibilities with child care responsibilities**. To be slightly more specific, this thesis defines a dual carer as someone who:

- Provides informal care to at least one recipient, *and*
- Provides child care to at least one child aged under 15

A straightforward visual representation of how dual care intersects with child care and informal care can be seen in Figure 2.2. This figure simply illustrates that people with dual care responsibilities have both child care and informal care responsibilities.

Figure 2.2 Visual representation of the definition of dual care



Informal care and child care have both been examined in detail over the course of this chapter and both have been assigned working definitions. To refer back to those working definitions we arrive at a more detailed definition of dual care, as follows:

A working definition of dual care

Dual carers

- **Provide unpaid assistance to one or more recipients experiencing difficulty due to disabilities, long term health problems or being frail aged, *and***
- **Provide informal, unpaid care to one or more children aged 15 years or younger (often referred to as parenting).**

As was the case with the working definitions of informal care and child care, the operational definition of dual care will vary slightly depending on the data set in use. Once again, these differences and their implications for analysis will be spelled out in Chapter Four – Data.

What is and what is not dual care?

Now that dual care has been clearly defined, it is useful to provide some actual examples of the kinds of caring relationships that dual carers may experience. There are a multitude of relationships which can make up someone's dual caring responsibilities. Some examples are listed below. A dual carer may;

- Provide care for an elderly parent who requires assistance due to being frail aged, *as well as* parenting or caring for a child or children aged less than 15 who lives at home with them.
- Provide care for a spouse who requires assistance due to a disability, *as well as* parenting or caring for a child or children aged less than 15 who lives at home with them.
- Provide care to one or more children with disabilities or long term health problems *as well as* one or more children without any special needs (aged less than 15 who lives at home with them).

These examples are by no means an exhaustive list, rather they serve to demonstrate that there are a number of different combinations of caring responsibilities that can constitute dual care. In addition to providing examples of what dual care can be constructed from, it is also useful to clearly

state the circumstances in which people would not be considered to be dual-carers. These circumstances include:

- Those with no caring responsibilities
- Those responsible for caring for any number of children with no disabilities or long term health problems (and with no other additional caring responsibilities)
- Those with only informal caring responsibilities and no additional child care responsibilities.

The limitations of other terms

Although dual care as it has been defined in this thesis has not been explored elsewhere, research does exist which touches upon the issues relevant to dual care. This includes a reasonable amount of research internationally, and a small body of Australian research which examines those with increased caring responsibilities. Some of this research will be examined in more detail in the following chapter "The known predictors and impacts of care". In the current chapter, this body of work will be examined in terms of its definitions. Three key terms will be presented and critiqued here, with particular attention paid to the reasons why these terms were not used in the place of 'dual care' in this thesis.

The existing body of work addressing increased caring responsibilities includes terms such as the 'sandwich generation' (Spillman and Pezzin 2000), 'women in the middle' (Brody 1981, 2004) and 'both end carers' (Lundholm and Malmberg 2009). Although all these terms are useful and form the basis of important research in their own right, they also all place certain restrictions on the defined group which are quite limiting.

By far the most well-known and commonly used term in this body of research is the 'sandwich generation'. Spillman and Pezzin (2000) define the sandwich

generation as a group of people, "especially of women, who are caught between the demands of child rearing and elder care while attempting to play a more demanding role in the work force" (Spillman and Pezzin 2000: 347). The problem with the term sandwich generation (in the context of this research) is twofold. Firstly, having the name 'generation' in the term implies that this group of people is an actual generation, such as the 'baby boomers' or 'generation X' born within a given time frame. While this may not be problematic in other research, for this thesis, limiting the group being investigated to those born within a certain time frame unnecessarily excludes too many potential carers from examination. Secondly, the 'sandwich' component of the term brings with it the idea that sandwich generation members must be caring for the generation above and below. The visual imagery for this term is clear; the sandwich generation are the meat in the generational sandwich, with older generation on one side and the younger generation on the other side, both requiring care from the 'sandwiched' generation in the middle. This is problematic in the context of this research as it excludes dual carers who may care for someone in their own generation or who are providing care to two members of the generation below. For these two reasons, 'sandwich generation' was excluded as the term describing increased caring responsibilities in this thesis.

Another reasonably well known term addressing those with additional caring responsibilities is 'Women in the middle' from Elaine Brody (Brody 1981, 2004). Brody defines women in the middle as women who are "in middle age, in the middle from a generational standpoint, and in the middle in that the demands of their various roles compete for their time and energy." (Brody 1981: 471). To be more specific, these women in the middle are also defined as such because they are in the middle of competing caring responsibilities – to their own children and partners as well as to their parents or parents in law (Brody 2004). Again, while a very valuable concept in its own right, the term 'women in the middle' has the same issue as the sandwich generation does – it

is too limiting for this research. Like the sandwich generation, women in the middle are in the middle in a generational sense. This means that those who experience increased caring responsibilities to members of their own generation, or only the younger generation would not be included in this definition. Then there is the even more obvious exclusion; women in the middle only includes women. It would be disingenuous to argue that men form a majority in the increased caring arena. In fact, the following chapters will demonstrate that both historically and currently, caring responsibilities are primarily fulfilled by women. However, there are still a significant number of men who provide care in Australia, and this in research I was reluctant to exclude them by using a gender-specific term.

Finally, 'both-end carers' (Lundholm and Malmberg 2009) was also considered as a term to describe the increased caring responsibilities of this research. Lundholm and Malmberg (2009: 121) describe both-end carers as those in four generational families "who have grandchildren in potential need of care while still having living ageing parents". Both-end carers was rejected for use in this thesis for similar reasons as the previous two terms. Once again, this term restricts the people being examined to those who care for the generation above and the generation two levels below. In order to have a more inclusive and comprehensive understanding of increased caring responsibilities, the earlier defined term 'dual carers' was developed for use in this thesis.

Conclusion

The primary purpose of this chapter was to present the concept of care as a whole, enabling a clear understanding of the many issues in this area of research. Care has been shown to be a complex concept with a variety of ways to approach and understand it. The examination of care began with the etymology of the word itself, followed by the study of the 'caring for' and

'caring about' dichotomy. The development of care as a social interaction was outlined and critiqued, and finally care was explored within the five levels of differentiation of caregiving.

The examination and critique of the literature surrounding the concept of care allowed for the detailed investigation and definition of the three key terms of this thesis. These terms are informal care, child care and dual care. All three terms have been examined in the context of the general definition of care, and situated within the five levels of caring. All three terms were also given working definitions, illustrating the exact ways in which they were being considered and used throughout this thesis.

This chapter has presented the first half of the literature review for this thesis. Now that the general concept of care has been investigated, and the specific terms of interest have been defined, the next chapter, Chapter Three – The Known Predictors and Impacts of Care will present the second half of the literature review. That chapter will investigate the existing research that shows what researchers already know about what predicts some kinds of caring behaviours, and what the impacts of those caring behaviours are. In doing so, the following chapter further illuminates the existing gap in the literature which will be addressed throughout the remainder of this thesis.

Chapter Three: The Known Predictors and Impacts of Care

Introduction

There is a wealth of Australian research regarding informal care and child care as separate concepts. Unfortunately, research which examines Australians engaged in both kinds of care is sparse. As the second portion of the literature review, the key purpose of this chapter is to examine and critique the existing literature regarding the predictors and impacts of providing informal care and child care. In doing so, the significant gap in the literature regarding dual carers is exposed.

The chapter is divided into three major sections, with each section addressing the known predictors and impacts of each type of care; informal care, child care and dual care. The first type of care to be examined is informal care. This section begins with the presentation of general information regarding the provision of informal care in Australia. The discussion of the known predictors and impacts of providing informal care are then separated into two segments discussed in depth. Given the dominance of cross sectional studies in the area (and their inherent inability to identify causation), this separation of predictors and impacts is at times arbitrary, but highlights the general need for longitudinal analysis in the study of care as a whole.

Following the examination of informal caring, the current body of Australian research focusing on the provision of child care will be presented. As with the informal care section, this will begin with some general information about caring for children in Australia, followed by the presentation of the known predictors and impacts of providing child care in Australia.

The third and final section presents the very small body of existing Australian research into dual care. This section will also include research which does not focus on dual carers specifically, but which addresses carers with more than one informal caring responsibility. Again, the sparsity of existing research into dual carers serves to highlight the gap in current knowledge and justify the need for further research. The final section of the chapter concludes with some speculation and theorizes what the existing literature could imply for the predictors and impacts of dual caring.

Informal care in Australia

General information

Before discussing the predictors and impacts of informal care, it is useful to take a general look at the state of informal care in Australia. Although some general information about informal care in Australia was presented in the previous chapter, that information focused on ways of defining and understanding informal care. In contrast, this section provides facts and figures about the provision of informal care in Australia.

The most comprehensive and recent examination of informal caring in Australia is the 2012 Survey of Disability, Aging and Carers (SDAC).[i] Conducted by the Australian Bureau of Statistics, the SDAC profiles Australians who receive and provide care. The most recent SDAC available (2012) reports there are almost 2.7 million informal carers providing assistance to those who needed help due to disabilities, long term health problems or old age. In other words, approximately 12 per cent of Australia's population are informal carers. This is an increase on the previous (2009) SDAC which finds 2.6 million carers. The 2003 SDAC also identifies 2.6 million people providing informal care and the first SDAC, conducted in 1998, finds 2.3 million carers.[ii]

Of the nearly 2.7 million informal carers identified by the SDAC, around 770,000 are considered to be primary carers, meaning they provide the majority of care to the care recipient. Therefore, approximately 29 per cent of informal carers identify as primary carers, which is about 3.4 per cent of all Australians. Other Australian studies into informal caring identify a higher proportion of primary carers, such as (Cummins, Hughes et al. 2007) who find that more than half of their respondents (58.2 per cent) identify themselves as the primary carer (defined as the person who provides most of the care). This disparity is more than likely the result of differing data collection approaches. The SDAC and other studies provide much more information regarding the characteristics of informal carers in Australia; these characteristics are fully explored throughout the later parts of this section (as the predictors or impacts of informal care).

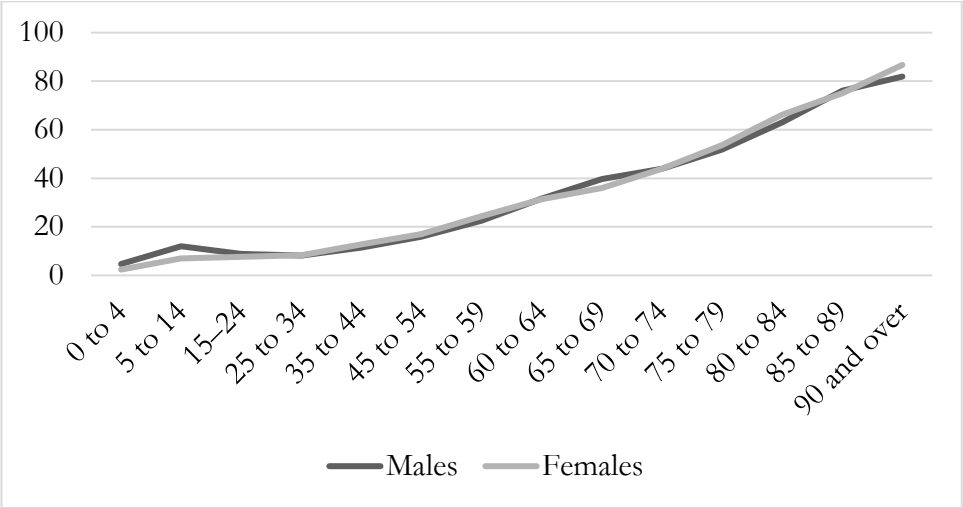
Although the SDAC likely provides the most accurate figures for the number of informal carers in Australia, there are issues involved in identifying informal carers which can impact on the accuracy of the measurement of informal care. Specifically, self-reporting of providing informal care may falsely reduce the number of identified informal carers. This is due to the fact that many people providing care (especially if they are not a primary carer) may not self-identify as carers, even if they meet the criteria provided. Refusal to identify as informal carers is attributable to a wide range of reasons, which have been further detailed in the report 'Who Cares? Report on the inquiry into better support for carers' (House of Representatives Standing Committee on Family 2009). Most commonly, carers do not self-identify because of a feeling that identifying as a carer reduces the complexity and mutual benefits of the relationship in question. Indeed, the reduction of complex caring relationships to something performed by an active caregiver to a passive care recipient links back to the warnings given in the previous chapter from the works of Fine (2004).

Who receives informal care?

The people who provide care are the primary focus of this thesis. However, caring is a complex social relationship between two parties, and as such, one party of the caring relationship cannot be comprehensively understood without some examination of the other. For this reason, the Australians who receive informal care are now considered.

The 2012 SDAC shows that 4.2 million Australians (approximately 18.5 per cent of all Australians) report having a disability. Findings from the first report of the 2015 SDAC indicate that this number has increased to 4.3 million (Australian Bureau of Statistics 2016b). Accounting for population growth, this is a very slight reduction in the proportion of Australians living with a disability. The SDAC shows that disability rates increase with age, and a slightly higher proportion of women reported having a disability (18.6 per cent) than men (18 per cent) (Australian Bureau of Statistics 2016b). The rise of disability rates as age increases is illustrated in Figure 3.1, which displays disability rates for men and women by age.

Figure 3.1 Proportion of Australians with disability by age and sex, 2015



Source: SDAC, ABS, 2015

People with a disability are less likely to participate in the labour force than those without a disability, 53.4 per cent of Australians with a disability and aged 15-64 in the labour force, compared to 83.2 per cent of the rest of the population (Australian Bureau of Statistics 2016b).

Although the 2012 SDAC identifies 4.2 million Australians with a disability, this should not be interpreted to mean that are 4.2 million Australians requiring care. In fact, only slightly more than half of Australians with a disability (living in households) report needing assistance with at least one activity[1]. Of those 2.4 million Australians requiring care, 1.4 million are aged 0-64 years old and just over one million are aged over 65. When expanded to include those living in cared accommodation, the number of Australians aged over 65 requiring assistance increases to 1.4 million.

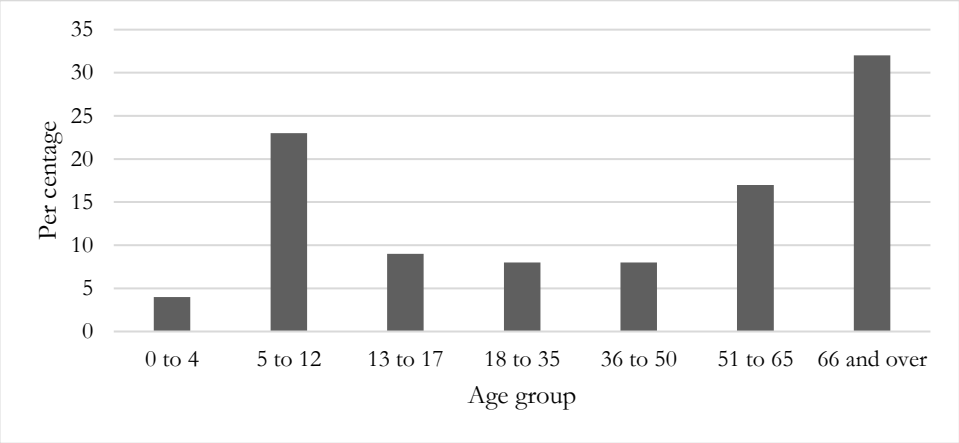
As detailed in the previous chapter, there are many different activities which people may require assistance with. The 2012 SDAC shows that for both age groups (under and over 65), people with a disability and living in households

[1] At the time of writing, this information was not yet available from the 2015 SDAC.

are most likely to require assistance with health care and property maintenance and less likely to require help in communication and meal preparation. The majority of Australians who require assistance receive at least some, with only 2.4 per cent claiming their needs for assistance have not been met at all. Two thirds of those requiring assistance reported that they receive all the assistance they needed, leaving around a third (nearly 1 million) requiring more assistance than they receive.

Although the SDAC gives valuable information about Australians with disabilities, and those receiving care in general, a more detailed examination of people receiving *informal* care can be found in the Families Caring for a Person with a Disability Study (FCPDS). The results of this study are detailed in the report 'The Nature and Impact of Caring for Family Members with a Disability in Australia' (Edwards, Higgins et al. 2008). While this study focuses on those providing informal care, it also provides useful information about the demographic characteristics of those receiving the care. In contrast to the SDAC disability rates, the FCPDS found that the majority of informal care recipients are male (58.7 per cent), and 41.3 per cent are female. Illustrated in Figure 3.2, the FCPDS shows that the age distribution of Australians receiving informal care is bimodal – meaning that the need for care has two 'peaks' across the life course. The first peak is in childhood at 5-12 years, and the second peak is later in life, at 66 years and older.

Figure 3.2 Proportion of Australians receiving informal care by age, 2006



Source: FCPDS, 2006

The FCPDS also presents information about the type of disability those receiving informal care report. The most commonly reported are physical disabilities, with nearly half of all respondents reporting this type of disability. The next most commonly reported are intellectual/learning disabilities with 16.6 per cent of respondents. 14.5 per cent of the respondents state the they experience multiple disabilities, and 11.5 per cent report psychiatric disabilities. Sensory/speech, acquired brain injuries and unassigned disabilities are the least common, which, combined are reported by just over 10 per cent of those receiving care (Edwards, Higgins et al. 2008).

More than half of the respondents receiving informal care from a primary carer state they receive more than 101 hours per week of care, and the vast majority of care recipients live in the same house as their carer (94.7 per cent). For most recipients of care in the FCPDS, care has been received for a long time, with only 10 per cent reporting having been cared for less than one year. Close to half of those receiving care report that they have been receiving care for seven years or more (Edwards, Higgins et al. 2008).

This segment has provided a brief summary of the demographics and experiences of Australians who receive informal care. It is important to

acknowledge that the brevity of this section does minimize the crucial and complex role that care recipients play within caring relationships. Unfortunately, given the focus of this research (which is the experiences of those who provide dual care) there is simply not enough time or space to expand the scope any further. Having briefly examined the proportion of the Australian population who receive care, the more detailed investigation of the providers of informal care begins with the known predictors of informal care.

Predictors of providing informal care

This section explores previous research which investigates the characteristics of Australian carers. It asks what characteristics make people likely to become carers, and questions why these characteristics make them more likely to provide care. The following reviewed literature suggests that gender, age, relationship status, health and work status and income can all play a role in predicting who is likely to provide informal care. It is important to clarify here that although these characteristics are referred to as 'predictors' of informal care, causality has not been clearly established for the characteristics explored. Rather, these are the characteristics which are associated with the provision of informal care, and are theorized to be predictive of it.

Gender

In reviewing the existing literature on caring, both as a general concept and specific empirical studies, the most frequently discussed aspect is the gendered nature of caring. Indeed, the gender disparity within informal care is so widely accepted that a number of studies into the impact of informal caregiving focus solely on women (Lee and Gramotnev 2007, Berecki-Gisolf, Lucke et al. 2008, Gray, Edwards et al. 2008, Nepal, Brown et al. 2011)

As previously stated, the SDAC is the most comprehensive study of carers in Australia, and the most recent SDAC shows that women make up 56 per cent of all informal carers. It also reveals an even greater gender imbalance when primary carers are considered separately; over two thirds of primary carers are women. The findings of the FCPDS also confirm the gender imbalance of informal care, with 77.5 per cent of its identified carers being female, and just 22.5 per cent male. The FCPDS consists of 1,002 primary carers who are receiving a Carer Payment or Carer Allowance, out of 5,000 potential participants randomly selected using Centrelink administrative data. Given the FCPDS consists of primary carers, the very large gender difference is in line with the SDAC's findings that there is a greater gender imbalance for primary carers. Data from the nationally representative, longitudinal survey 'Household, Income and Labour Dynamics in Australia' (HILDA) also finds that women dominate informal caring. In their examination of the HILDA data, Nepal, Brown et al (2009) demonstrate that 64 per cent of primary carers are women, and 36 per cent are men. Indeed, all literature reviewed that mentions the gender of carers in their studies identify a majority of women overall (Bittman, Hill et al. 2007, Cummins, Hughes et al. 2007, Zapart, Kenny et al. 2007, Burton-Smith, Keith R. McVilly et al. 2009, Nguyen and Connelley 2014).

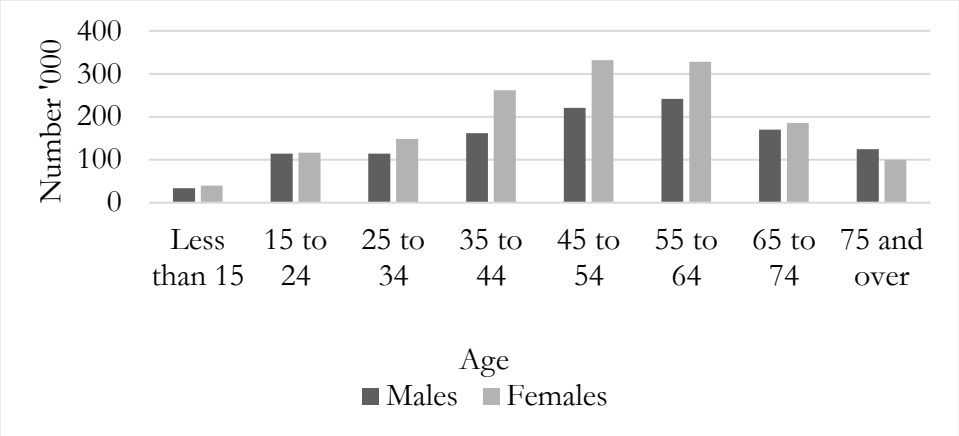
The domination of women in informal caring roles is not a recent phenomenon in Australia, with older Australian studies reporting similar findings. The Victorian Carer's Program as a longitudinal, representative survey of carers in the Australian state of Victoria undertaken over the 1990s which finds that 78 per cent of primary carers are female (Schofield, Bloch et al. 1998). Braithwaite's (1990) small scale study of carers in Canberra reports that three quarters of its caregivers are women, with the gender difference most pronounced when looking at those caring for someone other than a spouse.

Demonstrably, the over representation of women in informal care is not a recent phenomenon. Unsurprisingly, discussions of gender have also been prevalent in caring theory for many years. As stated by Daly and Lewis (2000) "care has for long been a woman-specific concept" . In fact, one of the key approaches to the study of care, referred to as 'the ethic of care' is based on its gender specific nature. The ethic of care is a concept developed by Gilligan (1982) as a counterpoint to previous 'stages of morality' which she argues favour men to the exclusion of the female (different) voice. Gilligan's ethic of care is based on feminine stages of morality in which one moves from an egocentric mindset, through a focus on caring for and protecting others, finally arriving at a 'morality' in which one balances their responsibility to care for others with caring for themselves. In short, women are more likely to become informal carers because they have an 'ethic of care', whereas male morality (or ethics) is less focused on the care of/for others. The idea of the ethic of care continues to feature in discussions around caring and has been both further developed and criticised by prominent authors such as (Kittay 1999, Tronto 2001). Some argue that rather than having an inherent 'feminine morality', women are actually socialised into the ethic of care, which requires them to be responsive to the needs of those around them (provide care), even to their own detriment (Stohs 1994, Hales 2007). Regardless of whether the ethic of care occurs naturally in women, or is imposed upon them through socialization, the ethic of care concept offers a useful way to understand how the gender imbalance in the provision of informal care occurs. This general understanding of how gender informs informal care is important because, as will be seen, gender has significant interaction effects on the way many other variables interact with informal caring. In other words, the way in which other variables predict the incidence of informal caring is different for men and women, and the effects of informal caring are also different for men and women in most variables.

Age

Just as there is a clear relationship between gender and the likelihood of providing informal care, Australians in certain age groups make up the majority of informal carers. Examining carers by age group and gender also suggests that there are interaction effects present between those two key variables. Once again, data from the 2012 SDAC provides a reliable illustration of the age composition of Australian informal carers.[2] Figure 3.3 shows the number of Australians providing informal care, by age and gender for 2012.

Figure 3.3 Number of carers by age and sex, 2012



Source: SDAC, ABS, 2012

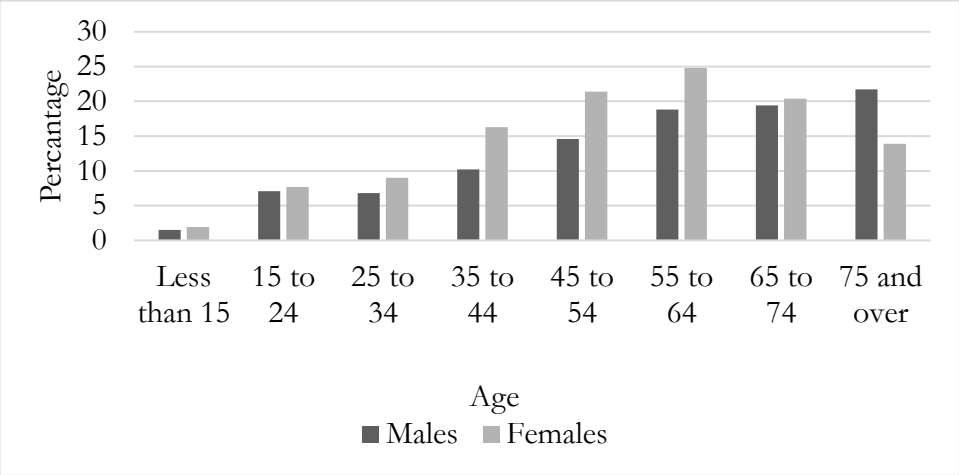
Figure 3.3 clearly indicates that mid-life (age groups 45 to 54 and 55 to 64) is the stage of life that the majority of Australian carers fall into. Again, we can clearly see that there are more female carers at all ages, except for the oldest age group (75 and over) when there are more male carers than female.

Although it is important to examine the number of carers in each age group, it is also crucial to look at the proportions of Australians in each age group who

[2] Data on informal carers from the 2015 SDAC was not available at time of writing.

provide care. This allows us to really see the 'shape' of caring in Australia, removed from the effects of population size. In other words, we need to make sure that the bulk of caring we see in the middle ages is not simply because these are the most populous age groups in Australia as a whole. Figure 3.4 presents the proportions of Australians in each age group who provide informal care, by gender for 2012.

Figure 3.4 Percentage of Australians who are informal carers, by age and sex, 2012



Source: SDAC, ABS, 2012

Figure 3.4 shows some obvious differences to Figure 3.3. Firstly, the percentage caring at older ages does not reduce substantially, indicating that the drop in the number of carers at older ages is due to a smaller population at that age. Indeed, the percentage of men providing informal care steadily increases with age to the point that there are nearly equal proportions of men and women providing care at ages 65 to 74, and by 75 and over there is a much higher proportion of men providing care than women. Other Australian studies have found similar patterns with regards to both the age distribution of informal carers (The National Centre for Social and Economic Modelling and University of Canberra 2009), and the different ages of female and male carers (Edwards, Higgins et al. 2008)

It is clear that people who provide informal care have a different age distribution to the general Australian population. As was the case with gender, it is easy to conclude that age predicts the likelihood of providing informal care. It has already been demonstrated that the need for informal care is highest in childhood and old age (Edwards, Higgins et al. 2008, Australian Bureau of Statistics 2013e), and the following section shows that most informal carers are caring for a child, spouse or parent. It therefore follows, that informal caring really starts to increase for women at the ages when they are most likely to have children or aged parents. It has been demonstrated that men are far less likely to provide informal care than women. This gender difference holds when broken down by age groups, except for men 75 and over. This is likely due to two cultural phenomena. Firstly Australian women have much higher life expectancies then men; recent figures from the ABS show that life expectancy at birth is 84.3 years for women, 79.9 years for men (Australian Bureau of Statistics 2013c). Secondly, Australian men tend to partner with women slightly younger than themselves. This is reflected in the median age at marriage, which is lower for women (29.4 years) and higher for men (31.4 years) (Australian Bureau of Statistics 2013i). These two phenomena combine to create a group of older women whose partners have died, and older men whose younger partners (with higher life expectancies) are still alive. As will be further discussed in the following section, being partnered increases the likelihood of providing informal care. This means that male informal carers outnumber female informal carers at the oldest age group because they are more likely to still have living partners to care for (Vaus 2004).

Relationship status and family structure

The majority of Australians who provide informal care provide it to a spouse, parent or child. This is demonstrated in the SDAC's examination of primary

carers' relationship to the recipient of their care. Around 330,600 Australian primary carers are caring for a spouse, which is just under half (43 per cent) of all primary carers. A further 23.5 per cent of primary carers are caring for a parent (approximately 180,000 people) and roughly 191,500 carers provide care to their child (24.9 per cent). The remaining 8.6 per cent of primary carers have relationships other than partner, child or parent with the recipient of their care. Other Australian studies confirm that the most frequent caring relationships are between partners, parents and children (Edwards, Higgins et al. 2008, The National Centre for Social and Economic Modelling and University of Canberra 2009, Nguyen and Connelley 2014)

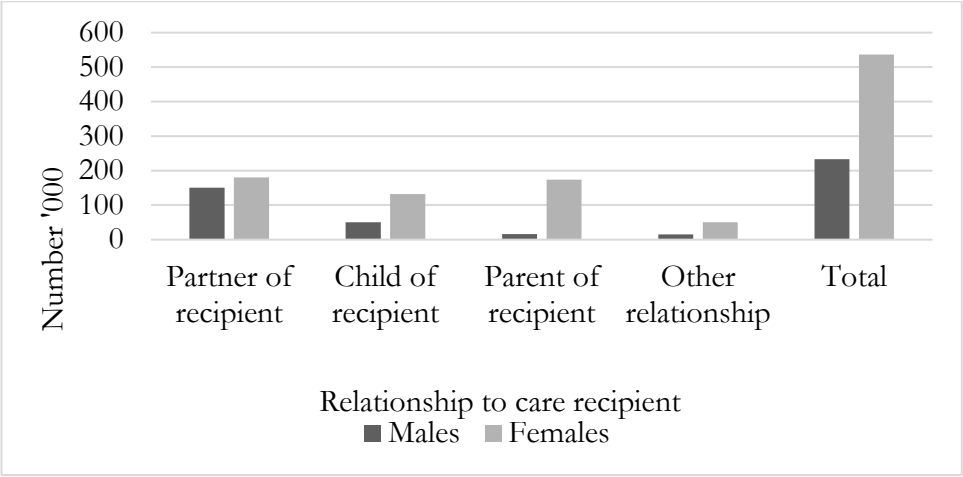
Given that over 90 per cent of the SDAC's primary carers are caring for an immediate family member (a partner, parent or child), it appears that informal carers (particularly primary carers) are more likely to be partnered and/or have children than the average Australian. Although the relationship status or family structure of carers in SDAC is not publicly available, there are other studies that provide this information. Once again, the best source of information is the FCPDS. The FCPDS shows that over two thirds (68.7 per cent) of the informal carers they surveyed were partnered, leaving 22.5 per cent not partnered (Edwards, Higgins et al. 2008)[3]. Another Australian study that provides information about carers' relationship status', is "The Wellbeing of Australians – Carer Health and Wellbeing" special report (Cummins, Hughes et al. 2007). This report finds that 73.2 per cent of its carer sample are either married or in a defacto relationship. In contrast, figures from the Australian 2011 census show that only 58.7 per cent of Australians are partnered (49.2 per cent in registered marriages, and 9.5 per cent in de facto marriages) (Australian Bureau of Statistics 2013a). These figures indicate that

[3] The study in question does not account for the remaining 8.8 per cent of the respondents. This could potentially be a mistake in the original paper, or the responses of this small group are missing (i.e. refused to answer, responded 'did not know' etc) for the relationship status questions.

informal carers have a higher proportion of people who are partnered than the general public.

It is also important to note here that the most common caring relationships differ for men and women. Men are most likely to provide care to a spouse (this happens late in life, as shown previously in Figure 3.4), and are far less likely to provide care to a child or aged parent. Overall, this fits with what we already know about informal caring in Australia; that women do most of it, but men provide more care at the oldest ages (to their spouses). This is demonstrated by the SDAC's presentation of relationships between primary carers and the recipients of care. This is illustrated in Figure 3.5, which clearly demonstrates that women provide a lot of informal care in many different caring relationships, the most common being the partner of the recipient, followed by being the parent of the recipient, then the child of the recipient. The least frequent types of caring relationships are those that fall outside of the first three groups. In comparison, it is evident that men provide care primarily to partners, much less to their parents, and significantly less again to their children or other people. Similar findings about the types of relationships between carers and those receiving care have been reported in other Australian studies (Edwards, Higgins et al. 2007, The National Centre for Social and Economic Modelling and University of Canberra 2009)

Figure 3.5 Primary carers' relationship to recipient of care, by sex, 2012



Source: SDAC, ABS, 2012

It can be reasonably concluded that people with partners and/or children are more likely to become carers than those without, simply because having partners and/or children means they have more opportunities to become informal carers than people without those relationships. However, this only addresses one side of the issue. It is also possible that being an informal carer impacts on relationship status and family structure, and this is discussed in the 'impacts of providing informal care' section of this chapter.

Economic status

Recent years have seen an increased interest in the relationship between economic status (generally employment and income) and the provision of informal care (Bittman, Hill et al. 2007, Leigh 2009, Access Economics 2010, Watts 2010, Nguyen and Connelley 2014). There is some contention regarding the direction of causality in the relationship between employment or income and informal carers. The key question here asks if being an informal carer impacts on employment or income, or if a person's employment status and income influence whether or not they are likely to become an informal carer. As such, this section of the literature review provides a brief description of the economic status of informal carers. In a later section, titled 'impacts of

providing informal care', the topic of economic status is revisited in more detail, and questions of causation are addressed.

The correlation between informal caring and low labour force participation, low income and financial stress is indisputable. According to the 2012 SDAC, the labour force participation rate for people without caring responsibilities (aged 15 and above) is 69 per cent, with 5 per cent unemployment. This means that over two thirds of non-carers are either working, studying or looking for work. The labour force participation rate for primary carers is significantly lower with just under half of primary carers in the labour force and 8 per cent unemployment. Secondary carers report higher levels of labour force participation than primary carers, but still lower than non-carers at 63 per cent (Australian Bureau of Statistics 2013g). Informal carers also differ from the general population in their level of employment; carers have higher rates of part time employment than non-carers do. Again, according to the SDAC, approximately 39 per cent of employed informal carers are employed part time, compared to 30.6 per cent of employed non carers (Australian Bureau of Statistics 2013g). Other Australian studies have confirmed low rates of labour force participation, and a high proportion of part time employment for informal carers (Schofield, Bloch et al. 1998, Edwards, Higgins et al. 2008, Leigh 2009, The National Centre for Social and Economic Modelling and University of Canberra 2009).

Given the previous figures on labour force participation and part time employment, it is not particularly surprising that informal carers also report lower incomes than non-carers. In terms of household income, the 2012 SDAC finds that informal carers are significantly more likely to have household incomes in the lowest quintiles (of equivalised gross household income) whereas non-carers are more likely to be in the highest quintile for household income (Australian Bureau of Statistics 2013g). Low income is also somewhat of a "double jeopardy" for informal carers, according to Cummins

et al (2007: 36), not only is the average household income lower for carers than non-carers, the wellbeing of informal carers is also more vulnerable to low income than the wellbeing of non-carers is. The impact of caring and low income on informal carers is explored further in the impacts section of this chapter.

In addition to having lower incomes, informal carers are also more likely to experience financial stress. Edwards, Higgins et al (2008) demonstrate that informal carers in the FCPDS (carers who were receiving the Carer Allowance or Carer Payment) are significantly more likely to report financial hardship than the general population in all of the following areas:

- Could not pay electricity, gas or telephone bills,
- Could not pay mortgage or rent on time,
- Pawned or sold something,
- Asked for financial help from friends or family.

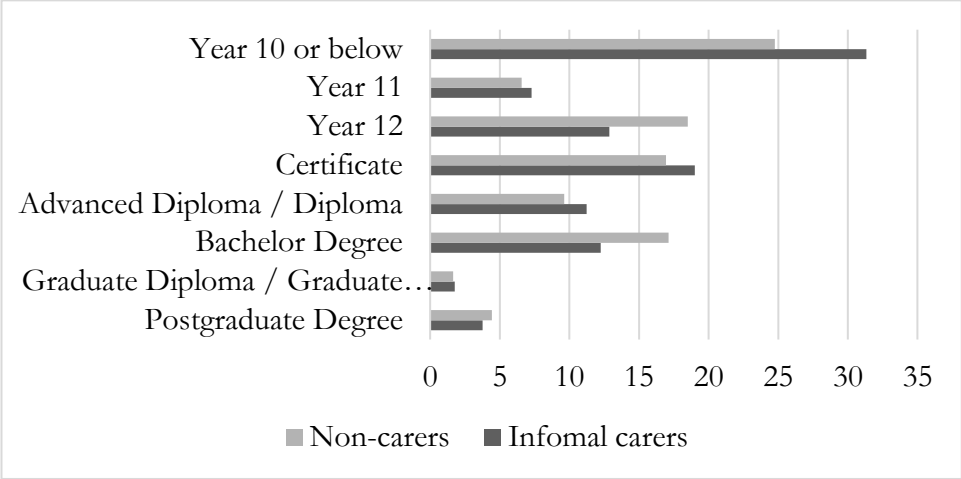
Other Australian studies report similar findings of informal carers experiencing lower incomes or higher levels of financial stress than the non-caring population (Cummins, Hughes et al. 2007, Burton-Smith, Keith R. McVilly et al. 2009, The National Centre for Social and Economic Modelling and University of Canberra 2009). In particular, Cummins et al (2007) conclude that informal carers are twice as likely to worry that their income will not meet their expenses, compared to non-carers. Further studies exploring the relationship between caring and employment and income in terms of causation (rather than just correlation) are reviewed in the following impacts of informal care section of this chapter.

Education level

The final predictor of informal caring investigated in the section is education level. Unsurprisingly, the 2012 SDAC is once again the best resource to see what the education levels of informal carers compared to non-carers are.

Figure 3.6 clearly illustrates the differing education level of informal carers and non-carers.

Figure 3.6 Highest level of education attained by caring status, 2012



Source: SDAC, ABS, 2012

There are three levels of education which are more commonly reported by informal carers, these are: Year 10 or below, certificate and advanced diploma/diploma. On the other hand, those without caring responsibilities more commonly report having completed Year 12 or obtaining a Bachelor's degree. Findings from other Australian studies also suggest that informal carers are less likely to hold higher levels of education than those without informal caring responsibilities (Edwards, Higgins et al. 2008).

The impacts of providing informal care

Gender, age, relationship status and family structure, and socio-economic status appear to be characteristics associated with informal caring. This section addresses the ways in which informal caring is either known or theorized to impact informal carers in Australia. This begins with the impacts of informal caring on physical and mental wellbeing, followed by income and employment. The positive impacts of informal care are also presented, illuminating the lack of Australian research in this particular area. Finally,

theories explaining why informal caring impacts the way it does will be analysed. It must be stressed that the majority of studies included here are cross sectional, meaning they often cannot comment beyond correlation. For many, their placement in the 'impacts of providing informal care' section is based on theoretical considerations, rather than the ability of the studies themselves to identify causation.

Physical and mental wellbeing

The effects of caring on the physical and mental wellbeing of informal carers is perhaps best introduced via the 2007 paper "The Wellbeing of Australians – Carer Health and Wellbeing" (Cummins, Hughes et al. 2007). As a special report published by the Australian Unity Wellbeing Index, this research presents a comprehensive study of carer wellbeing. The purpose of the Australian Unity Wellbeing Index is to assess the wellbeing of various groups of interest in the Australian community. This particular paper is the result of a targeted survey identifying carers through membership of Carers Australia. A normal range on the Personal Welling Index is considered to be 76.4 to 73.4; Australian carers, however received an average score of just 58.5 (Cummins, Hughes et al. 2007). This is the lowest collective wellbeing of any group previously examined by the Australian Unity Wellbeing Index; even lower than other groups such as the unemployed, those with very low incomes and those living alone. Using the DASS[iii] depression scale, Cummins et al also find that over half of their respondents (56 per cent) experience at least moderate levels of depression. This result is confronting given that other national studies show that only 6 per cent of the Australian population are estimated to be depressed (Commonwealth Department of Health and Aged Care, 2000; National Survey of Mental Health and Wellbeing, 1997 cited in (Cummins, Hughes et al. 2007). Similar results are found for stress levels, with the average carer experiencing moderate levels of stress, more than the average non-carer. Another finding of note with regards to the personal wellbeing index is that

female carers have significantly lower scores than male carers. This difference is even more notable given that in the general population, women on average have higher personal wellbeing scores than men. Cummins et al also find that although carers have lower wellbeing at all ages than non-carers, the gap is smaller at older ages.

In terms of physical health, the Carers' Health and Wellbeing Study reveals that carers experience more physical pain than the general population. Half of the general population report very little or no pain (0-1 on a 0-10 scale), whereas only one quarter of the caring population report 0 or 1 for levels of pain. In addition to this, carers are shown to be more vulnerable to pain than the general population. Carers are also likely to be carrying an injury caused by their caring; only 35.3 per cent of carers report that they do not carry such an injury.

Another comprehensive examination of carers' physical and mental wellbeing can be found in the FCPDS. Looking first at mental wellbeing, the FCPDS finds that carers report significantly worse mental health and vitality than the general population. Similar to the work of Cummins et al, Edwards et al (Edwards, Higgins et al. 2008) also show that caring has a bigger impact on the mental health of women than it does on men. Specifically, they report that "the size of the gender difference in mental health scores for carers was twice that of the general population, suggesting that caring affects females' mental health more than males, even after accounting for the size of the gender difference in the general population" (Edwards, Higgins et al. 2008).

In addition to exploring the financial impacts of caring on women, the report "Women Carers in Financial Stress" also examines the effects of caring on health. The report states "that two to four times the proportion of women primary carers report their health as being only fair or poor compared with other women of a similar age, and that the impact of caring on the health

status of the carer increases as the carer ages" (The National Centre for Social and Economic Modelling and University of Canberra 2009: 28).

In a mixed methods study of Australians providing informal (palliative) care, Zapart et al (2007) conclude that caring has negative impacts on carers' mental health, however, they do not find the provision of palliative care to have a negative effect of carer's physical health. In the qualitative section of their study, Zapart et al identify several key issues impacting on carers' mental health. These include a general sense of fatigue, exhaustion or frustration due to the intensity and time constraints of caring. Zapart et al also state that it is not clear whether the mental strain experienced by those in their study is due to the provision of care or to the care recipient's illness.

Once again, most of these studies identify a correlation between poor physical and mental health and informal caring, rather than demonstrating a causal link. The likelihood that informal caring occurs first (and causes) reductions in physical and mental health is based in theory and will be further explored in the theoretical considerations segment of this section.

Economic status

The previous discussion of labour force participation, employment and income clearly demonstrates that Australians who provide informal care are significantly different from the non-caring population in those areas. Specifically, informal carers have been shown to experience lower levels of labour force participation, higher rates of part time employment and lower levels of income than people who do not provide informal care. What has not been addressed (yet) is the question of causality. A number of studies have attempted to find out whether it is the act of providing informal care that causes lower labour force participation, higher rates of part time employment and lower income, or if people who are out of the workforce, employed part time or have lower incomes are somehow more likely to become informal

carers. Although the evidence to date is mixed, the majority of existing research concludes that it is informal caring which impacts employment and income. This research includes both cross sectional and longitudinal analyses that conclude that the provision of informal care reduces labour force participation, reduces full time employment (increasing the proportion of part time employment), lowers income and increases financial stress. These studies are now presented.

The report 'Women Carers in Financial Stress' (The National Centre for Social and Economic Modelling and University of Canberra 2009) offers a cross sectional examination of the impact of caring on female carers. Using data from the 2003 SDAC, and wave 6 of HILDA, this report examines the differences between female primary carers and female non-carers with similar characteristics. It concludes that the provision of informal care impacts economic wellbeing in terms of lower rates of paid labour force participation, fewer work hours and higher levels of financial stress. This study also addresses the long term financial impacts that caring has on women. Specifically, it suggests that reduced income and labour force participation result not only in less money accumulated over a lifetime, but also in significantly reduced superannuation. This leaves female primary carers in a financially vulnerable position in old age. Watts (2010) also investigates data from the 2003 SDAC. Using univariate and bivariate analysis, this study finds that rates of labour force participation for informal carers "are adversely affected by their provision of informal care to the disabled and elderly"(Watts 2010: 18). Although both the aforementioned studies claim it is the provision of informal care causing the reductions in labour force participation, they are not able to demonstrate beyond doubt that this is the case, simply because they only draw on cross sectional data which generally identifies correlation rather than causation.

Cross sectional analyses can begin to investigate the impact of caring in these areas by asking informal carers about how they feel caring affects them. The FCPDS asks respondents their own opinions about barriers to employment. Nearly one quarter of respondents (23 per cent) report that "difficulty in arranging work hours" is their main barrier to employment. Nearly as many (22.4 per cent) claim that having "no alternative disability care arrangements" forms a barrier to their employment.

Although cross sectional studies offer useful insights into the relationship between caring and economic status, longitudinal data is required to address questions about causality (Rose 2000b). With data from the Australian Longitudinal Study on Women's Health, Berecki-Gisolf et al (2008) use a logistic regression model to investigate whether women's transitions into informal caring are dependent on their previous labour force participation, and whether their labour force participation is influenced by informal caring. Taking into account sociodemographic and health variables, they conclude that "transitions into caregiving were irrespective of time spent in paid employment, but were followed by a decrease in labour force participation" (Berecki-Gisolf, Lucke et al. 2008: 122). In other words, labour force participation does not affect or predict informal caring, but informal caring does have a clear impact on labour force participation (it reduces it). Lee and Gramotnev (2007) also analyse data from the Australian Longitudinal Study on Women's Health and reach similar conclusions. Longitudinal analysis including male carers can be found in the work of Bittmen et al (2007), who use HILDA data from 2001 to 2004. They find that carers have much lower rates of employment and income than non-carers. Importantly, they conclude that there is no statistically significant difference in income between those who never provide informal care, and those who *go on* to provide informal care informal care in the future. In other words, they argue that it is informal care which causes reduced hours of work and low income, and not the other way around. They also find that the impact of providing care on employment

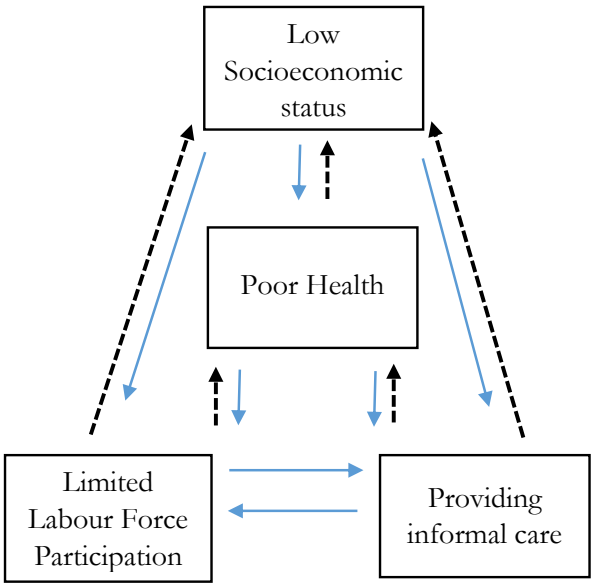
and income is greater for women than it is for men (Bittman, Hill et al. 2007). Similar to the "Women Carers in Financial Stress' report, Bittman et al also raise the possibility that the economic impact of providing informal care could have lifelong implications in terms of life-time income and retirement savings.

Although a number of studies argue that informal caring reduces employment and lowers income, there is research which disputes this and suggests that people with lower levels of employment and income are more likely to become carers. In other words, that economic status is a predictor of the likelihood of becoming an informal carer. Leigh (2009) analyses data from HILDA, but reaches very different conclusions to the previous authors. Specifically, Leigh argues that although cross sectional analysis do show that carers have lower levels of labour force participation, fewer hours worked and lower incomes than non-carers; his longitudinal analysis including individual fixed effects demonstrates that the actual causal effect of providing care is little to none. Although Leigh offers that these results could mean that the effects of providing care take a very long time to manifest (and thus have not been captured in the seven years of HILDA data used), he suggests that this is unlikely. Rather, Leigh (2009: 9) argues that it is more likely "that the large estimated effects from cross sectional regressions are driven by individual heterogeneity – meaning that the kinds of people who provide care tend to have low levels of labour force attachment even before or after they have provided that care". This study was not included in the 'predictors of informal care' section of this chapter because Leigh is not necessarily arguing that low levels of labour force participation predict or cause informal caring, just that informal caring does not reduce labour force participation.

Overall, the reviewed literature suggests that it is informal caring which impacts employment and income. However, the contradictory findings of Leigh (Leigh 2009) indicate that the relationship between informal care and employment and income could be more complicated than originally thought.

Berecki-Gisolf et al (2008) offer a useful schematic representation (Figure 3.7) of the possible ways in which the provision of informal care could interact with employment and income. In this figure, solid arrows indicate "possible pathways leading to caring and to limited labour force participation." The dashed arrows represent the "possible effects of caring and limited labour force participation on health and socioeconomic status." (2008: 123)

Figure 3.7 Schematic representation of possible interactions between socioeconomic status, poor health, labour force participation and the provision of informal care



Source: Berecki-Gisolf et al, (2008: 123)

This figure illustrates that there may not be simple causal relationships between caring, health, labour force participation and health. Rather, these variables could have complicated relationships in which all can potentially impact each other. Evidently, the complex interplay between informal caring and other variables requires further exploration.

Why does informal care impact the way it does?

The literature reviewed thus far has illustrated an overwhelmingly negative impact of providing informal care. These negative impacts have included poorer physical and mental wellbeing, relationship stress and breakdown, reduced labour force participation and increased financial stress. There is a theoretical explanation to the idea that caring often has a negative impact on those who provide it. This is often referred to as 'caregiver burden', or the 'burden of care'. Caregiver burden is defined as "the physical, psychological or emotional, social and financial problems that can be experienced by family members caring for impaired older adults" (George and Gwyther 1986: 253). Although George and Gwyther's definition refers to the care of impaired older adults, the concept is applicable to all types of informal caring relationships. The idea of caregiver burden was originally developed from Lazarus and Folkman's (1984) 'transactional model' which conceptualises stress as resulting from an imbalance between the demands of a situation or relationship and the individual's resources to meet those demands.

Numerous researchers have applied the theoretical construct of the transactional model to the provision of informal care, but perhaps one of the most useful and comprehensive applications is from Braithwaite (1990, 1992). Braithwaite argues that although there are some similarities between child care and informal care, there are clear differences that result in informal caring being more frequently experienced as a burden. Specifically, Braithwaite (1992:15-18) argues that there are five distinct crises of decline which exacerbate the negative effects of informal caring (or the 'burden of care') which are either absent or of weaker effect in child caring. These five 'crises of decline' offer a potential way in which to understand how caring impacts on carers, and why caring impacts different groups in different ways. The five crises of decline are as follows;

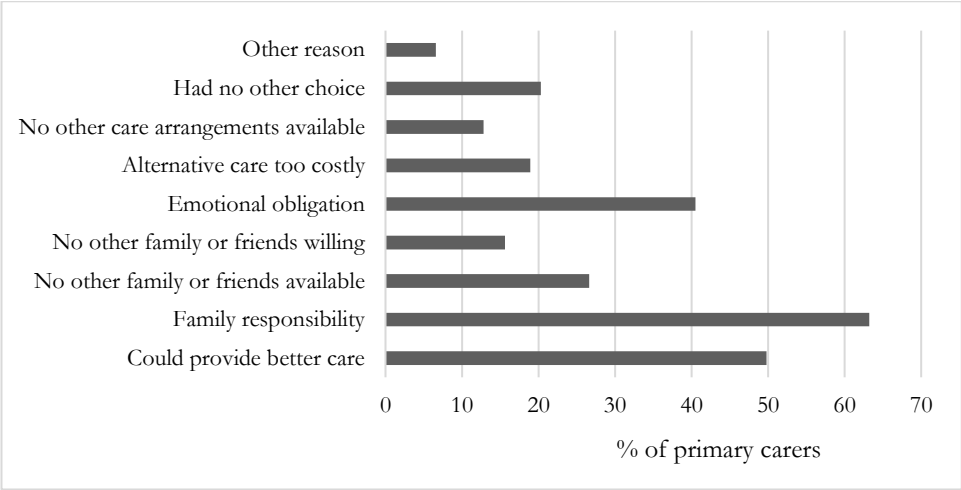
1. Awareness of degeneration
2. Unpredictability
3. Time constraints
4. The caregiver-care receiver relationship, and
5. Choice restrictions

The first crisis; awareness of degeneration, refers to the deterioration of the care receiver's condition. The effects of disease, disability or ageing can potentially worsen over time, leaving the care receiver with increasing needs for assistance. Braithwaite argues that awareness of degeneration can leave carers feeling hopeless, frustrated and fearful of further degeneration. Unpredictability, the second crisis, impacts on carers by undermining stability and security. It frequently stems from degeneration in that carers are often unable to predict how or when the condition of the care receiver will deteriorate. However, unpredictability can also be present without degeneration, it may simply be the nature of a particular caregiving relationship that the need for assistance could vary without any warning. The third crisis, time constraints, is perhaps the most self-explanatory crisis. It has also received the most attention from other researchers, usually in the form of 'role overload' or 'role conflict' discussions (which will be explored in detail later). Time constraints occur when carers have conflicting responsibilities, such as employment or other family obligations, or simply not enough time to meet all their commitments. Braithwaite argues that this impacts on carers in that they will be less likely to perform all of their tasks as well as they would like, which effects self-esteem, and their interpersonal relationships may become strained due to the lack of time invested in them. The fourth crisis of care is the caregiver – care receiver relationship. Braithwaite postulates that self-worth can be undermined by destructive caring relationships, and also that those in loving, close caring relationships can lose their feelings of security through the fear of loss. This is described as the loss of the person being cared for through death or progression of disease or disability, and loss

of the relationship as it was without the caregiving/receiving aspect. In other words, caregiving relationships may break (or simply lack) clear norms about how to conduct the relationship. The final crisis of care identified by Braithwaite is choice restriction. The idea of choice in caregiving was also touched on in the presentation of the levels of caring by Schofield et al. Braithwaite argues that choice is an important determinant of the burden of care. This is because when carers feel that they have not had much choice in assuming their caring responsibilities, they can be left experiencing a lot of strain in meeting those responsibilities and feeling out of control, resentful and trapped.

The presence of choice restrictions is evident in the reasons given by Australian informal carers as to why they take on caring responsibilities. The 2012 SDAC specifically asks primary carers what their reasons are for taking on a caring role. Figure 3.8 details the responses given. Three reasons stand out as the most common. By far the most frequently given reason for taking on the caring role is the feeling of family responsibility, which 63 per cent of primary carers cite. The next common response is the belief that they can provide better care; half of all primary carers state that this is a reason for taking on the caring role. The third most common response was an emotional obligation to provide care, with 41 per cent of primary carers stating this is a reason they provide care.

Figure 3.8 Primary carers' reasons for taking on caring role, 2012



Source: SDAC, ABS, 2012

Two of the three most common reasons for taking on a caring role (family responsibility and emotional obligation) can be interpreted as having an underlying factor of obligation and expectation. The other most common reason (could provide better care) could also imply that informal carers do not feel there are many other quality ways of acquiring care. In any case, although these reasons may demonstrate that primary carers care about (not just for) the people who receive their care, all of the choices listed (except 'other reason') arguably imply some form of choice restriction forcing the hand of informal carers.

In addition to offering a general explanation for the negative impacts of providing informal care, lack of choice may be pertinent to the different ways in which the provision of care impacts men and women. As discussed previously, not only do women provide the majority of informal care, they are also more heavily and frequently impacted by it. Female carers experience lowers levels of physical and mental wellbeing than male carers, and have lower rates of labour force participation and income than male carers. Given the societal expectation for women to be caregivers (also previously explained earlier in this chapter) women may feel they have less choice in becoming a

caregiver, resulting in a heavier 'caregiver burden'. Braithwaite's crises of decline are explored further in the dual care section of this chapter, with particular attention paid to the idea of time constraints and its contribution to role overload.

Although it offers a useful way of understanding why caring has many negative impacts, the general idea of caregiver burden has attracted significant and valid criticisms. Much of the push against the understanding of care as a burden comes from feminist disability activists such as Keith (1992) who argues that conceptualising care as 'burden' creates and emphasises a perception of people with disabilities as helpless and passive. Keith acknowledges that while this often happens due to a desire to show the previously unrecognised difficulty involved in caring, references to the caregiving burden portray the person receiving care as "passive, feeble and demanding" (Keith 1992: 169). Other feminist researchers, such as Morris (1991) agree that much research into caring creates a false dichotomy of 'us and them' ('us' being care providers and 'them' the recipients of care). This dichotomy results in those who receive care being construed and excluded as the 'other'. Morris suggests that to address this problem, researchers should acknowledge and focus on the reciprocal nature of caring relationships as well as focusing on the experiences of those receiving care.

Other authors, such as Kittay (1999), seek to remind us that the provision of informal care is not always experienced in a negative way. Kittay argues that the experience of providing care is not just one-dimensional and while there are negative aspects, there are also many positive impacts:

> Those who do dependency work, be it familial or paid, garner the satisfaction of doing a labor of love. They watch an infant flourish; they comfort a sick person; they return the loving care they received from a person who cares for them. They also become vulnerable to

> economic deprivation, lack of sleep, disruptions of their own intimate life, loss of leisure and career opportunities, and so on . . . In their labours, dependency workers subject themselves to work conditions which are among the most emotionally and morally demanding. These demands are constitutive of the labor itself. (Kittay 1999: 183)

Many of the positive aspects of providing care referred to by Kittay are not easily quantifiable, which means they are often neglected in empirical studies. It is fairly straightforward to quantify and measure something like employment or hours spent in leisure time. Outcomes such as a sense of satisfaction or a strengthening of a relationship are more difficult to capture in quantitative settings. Qualitative analysis providing more in-depth examinations of the complexities of caring relationships would stand a much better chance of uncovering the positive ways in which caring relationships enhance the lives of those involved.

Unfortunately, the explicit exploration of the positive impacts of care (informal, child and dual), and the experiences of those receiving care are outside the scope of this thesis. Given time and resource constraints the focus of this research remains with existing quantitative data on care providers (which is likely to uncover more negative impacts of caring). This is not to say that the research presented throughout this thesis is incomplete, rather it is an acknowledgment that with every methodological decision, results are limited in some way. The examination of the positive impacts of care and the experiences of those receiving care are not addressed in this thesis, but present an opportunity for further research.

Conclusion

Before the next section, and the discussion of child care responsibilities begins, it is worthwhile to briefly summarize what the available literature has told us about the provision of informal care in Australia. In terms of the characteristics which predict informal care, it has been established that being female, being partnered, having lower levels of educational attainment and being aged 55 to 64 (for women) and over 75 for men are all associated with taking on an informal care role. Although there is still much that is unknown about correlation and causation in the relationship between economic status, health and wellbeing and the provision of informal care; much of the research indicates that the provision of informal care negatively impacts on economic status (specifically income and employment) and physical and mental health and wellbeing. It has also been shown that the impacts of the provision of informal care are different for men and women. Braithwaite's five crises of decline were examined and offered as one explanation as to why the provision of informal care appears to impact in a number of negative ways. Intensity of care, or time spent caring, is one area which has not received adequate attention in the existing literature. Finally, the positive impact of informal caring was identified as an area which requires more qualitative investigation.

The literature reviewed on informal care in this section, combined with the previous research into child care in the following section helps to identify the gap in the literature regarding dual care, as well as allowing for theory and speculation about what the predictors and impacts of dual care may be.

Caring for children in Australia

Similar to the reviewed literature on informal care, the review of existing research regarding child care responsibilities begins with general information about the provision of child care in Australia. This includes facts and figures about who provides child care as well as research showing how much time

many parents, grandparents and other child carers spend caring for children. Following the general background, the existing literature exploring the predictors and impacts of child care responsibilities is discussed.

In contrast to the previous section, the section regarding child care responsibilities is brief. This is due to two factors; firstly, there is significantly less contention around the caring relationship between children and those who care for them (compared to informal caring relationships). Secondly, although dual care comprises of both child care and informal care responsibilities, it is informal caring responsibilities which are more unique and of particular interest to this research. Child care responsibilities therefore receive proportionally less attention in this chapter. However, child care responsibilities still comprise half of the concept of interest (dual care) and as such a succinct examination of previous research in this area is provided.

General information

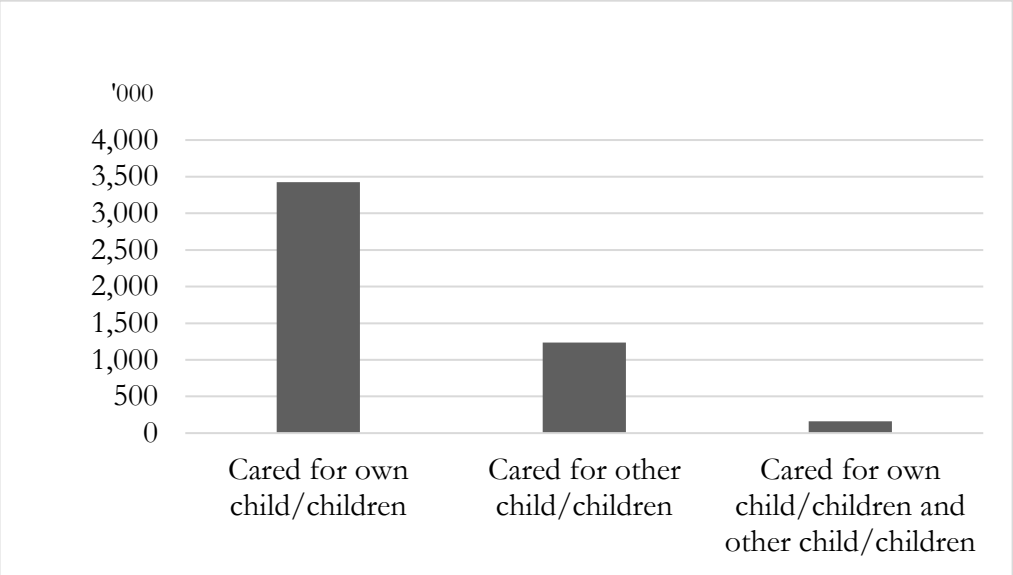
The Australian Census provides a reliable source of data on Australians providing and receiving child care. According to the latest Census (2011), there are over five and a half million (5,684,062) families living in households in Australia. Over 60 per cent of those households are comprised of families with children (Australian Bureau of Statistics 2013a). The Census also shows that there are over 4 million children aged 0-14 years, who account for nearly one-fifth (19.3 per cent) of the total population.

In addition to Census data, another useful data source is the Family Characteristics and Transitions publication (2015c). Compiled from the Multi-Purpose Household Survey (MPHS) 2012-13 financial year, this report reaches similar conclusions to the Census data – finding approximately 3.9 million Australian families with resident children (Australian Bureau of Statistics 2015c). Narrowing this down to only families with dependent children (defined by that study as aged 0-17 years of age), the Family

Characteristics and Transitions report identifies 2.8 million families. It also finds just over 5 million children aged 0-17 years (Australian Bureau of Statistics 2015c).

While those statistics give a general sense of the proportion of Australians who are likely to be involved with child caring, the Census also explicitly asks if Australians provide any unpaid child care (to children aged 0-14 years) in the two weeks prior to census. In 2011 more than 4.8 million Australians report providing unpaid childcare to their own children, other children or both in the previous two weeks (Australian Bureau of Statistics 2011b). This means that slightly more than one quarter (27.8 per cent) of the total Australian population self identifies as having informal child care responsibilities. As can be seen in Figure 3.9, the vast majority of those with informal child caring responsibilities provide care to their own children.

Figure 3.9 Australians reporting providing unpaid child care, 2011

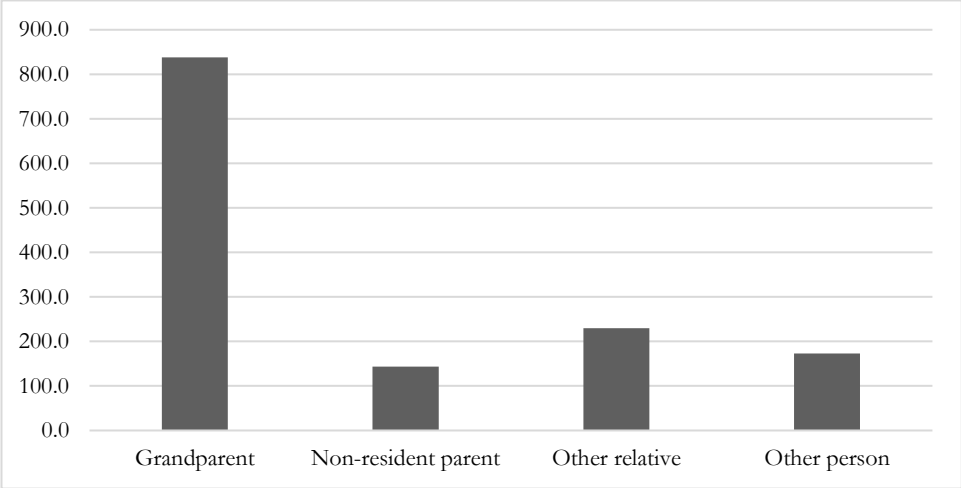


Source: Australian Bureau of Statistics, Census data, 2011, Census TableBuilder

Another data source which captures non-parental informal child care is the Childhood Education and Care Survey, also collected by the ABS (2015b). The most recent Childhood Education and Care Survey conducted in 2014

shows that 1,257,200 Australian children receive regular informal care. This equates to nearly 38 per cent of all Australian children receiving regular informal care from someone other than a resident parent. The relationships of those providing child care (to the child in question) are illustrated in Figure 3.10.

Figure 3.10 Provider of usual informal child care to child, 2014



Source: Australian Bureau of Statistics, Childhood Education and Care Survey, 2015

For those children receiving informal care, the vast majority of care is provided by grandparents. As shown in Figure 3.10, grandparents are the main providers of informal child care for the children of working parents in Australia. Specifically, 30 per cent of children with two working parents receive regular care from a grandparent. A similar proportion (31 per cent) of children of single working parents also receive regular care from a grandparent (Australian Bureau of Statistics 2015b).

Time spent caring

In 2006, the ABS Time Use Survey asked Australians how they spend their time. Although the data is now ten years old, the Time Use Survey is useful here because it is the most recent, representative Australian data which asks

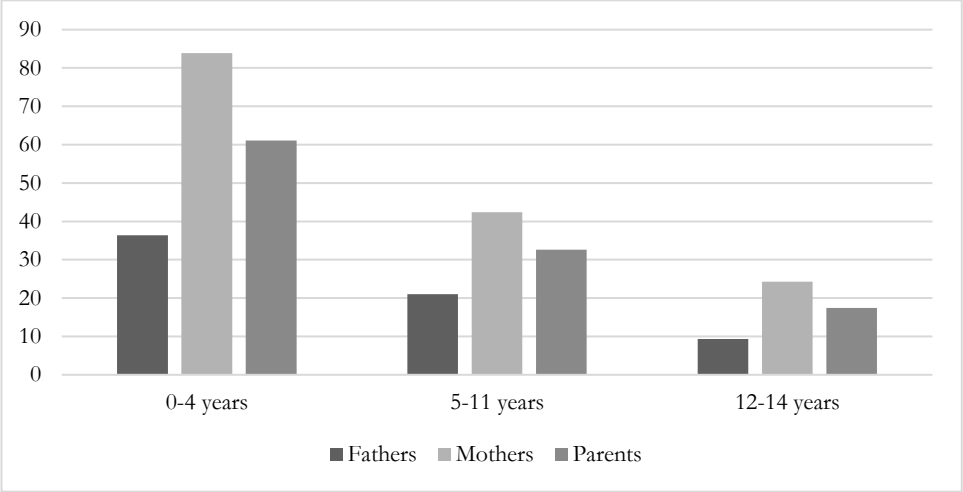
respondents to estimate how much time they spend participating in various unpaid child care activities. These activities include;

- care of children,
- teaching, helping, reprimanding children,
- playing reading, talking with children
- minding children
- visiting child care establishments/school
- associated travel
- other activities

The survey found that Australians spend on average 41 minutes per day engaged in the aforementioned unpaid child care activities (Australian Bureau of Statistics 2006). When separated by gender, it is apparent that women spend more than double the amount of time caring for children (59 minutes per day) than Australian men (22 minutes) (Australian Bureau of Statistics 2006). Looking specifically at parents with children aged 0-14 years the difference is even more pronounced with mothers spending on average 8 and a half hours per day involved in child care, and fathers spending less than half that amount of time (just under 4 hours) caring for their children (Australian Bureau of Statistics 2006).

The age of the children being cared for also dramatically impacts the amount of time that care is provided to them, with younger children predictably requiring more care than older children. The difference of care required by different aged children, as well as the gender difference in time spent caring is illustrated in Figure 3.11.

Figure 3.11 Hours per week spent caring for children, by age of youngest child, 2006



Source: Australian Bureau of Statistics, How Australians Use Their Time, 2006

Figure 3.11 clearly demonstrates that the younger the child, the more time parents spend providing care. When their youngest child is aged 0-4 years, Australian women spend an average of nearly 84 hours per week providing child care, compared to an average of just over 24 hours per week when the youngest child is aged between 6-14 years. At all ages of youngest child, Australian fathers spend less than half the time providing care than mothers do. This discrepancy between men and women in the provision of unpaid child care is explored more fully in the following gender section of the predictors of child care.

Many grandparents also spend significant amounts of time caring for their grandchildren. A study by Gray, Mission and Hayes (2005) using data from the Longitudinal Study of Australian Children demonstrates that around one in five young children (infants and those aged four to five years) receive regular care from a grandparent. Both age groups of children receive on average just over two days per week of care from a grandparent (Gray, Mission et al. 2005). Grandparents who are born in countries other than

Australia are also more likely to spend more time caring for grandchildren than their non-migrant counterparts (Drysdale and Yaman 2000).

Predictors of providing child care

There are a number of characteristics that previous research has shown make Australians more susceptible to taking on unpaid child care responsibilities. Unsurprisingly, many of these characteristics are similar to those associated with informal caring responsibilities. Gender, age, relationship status (and family structure) and socio-economic status all appear to play a role in predicting which Australians are more likely to provide unpaid child care. Previous research exploring these themes is now presented, beginning with the role of gender in the provision of child care.

Gender

Just as there is no question that the bulk of informal care is provided by women, the provision of unpaid childcare in Australia is also dominated by women. Although the second wave of feminism in Australia saw significantly increased female labour force participation (Baxter 2013a), and Australian fathers have increased the time they spend caring for children (Craig, Powell et al. 2014), Australian families, on the whole, are yet to achieve gender equity in terms of caring for children. The following studies illustrate this continued disparity.

It has already been shown through Australian time use data that, on average, mothers still spend more than twice the amount of time providing child care than fathers do (Australian Bureau of Statistics 2006). Scores of other Australian researchers also conclude that women are more likely to provide child care than men (Bittman, England et al. 2003, Craig 2006b, Chester, Baxter et al. 2009), that women spend more hours providing unpaid child care than men do (Baxter 2000, Craig 2006b, Baxter, Gray et al. 2007, Hewitt, Baxter et al. 2011), and that women are more likely to undertake the more

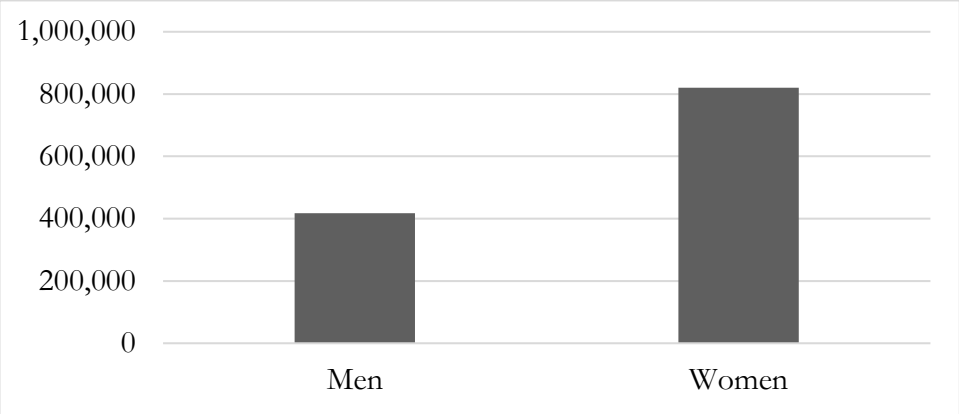
intensive (less 'fun') activities of child care than men are (Craig 2002, Craig 2006b, Baxter and Smart 2011, Craig and Jenkins 2016a). It was also demonstrated in the previous chapter that child care activities are often undertaken as secondary activities (generally performed alongside other unpaid household labour), and that women are more likely to undertake those additional activities while caring for children than men are (Craig 2006a, Craig and Jenkins 2016a).

The transition into parenthood increases the gender divide of unpaid household labour, with mothers substantially increasing the time spent in unpaid household labour on the birth of the first child, whereas men's involvement in unpaid household labour remains largely stable even after the birth of children (Baxter, Hewitt et al. 2008). Australian women are also more likely to use alternative work arrangements to facilitate caring for their children than men are (Craig and Powell 2012, Australian Bureau of Statistics 2015b). In particular, women are for more likely to be part time employed than men once they have children (Baxter, Hewitt et al. 2005). Even when both men and women within a family are employed full time, women still perform far more time in child care and other unpaid household labour than men do (Baxter, Hewitt et al. 2005). There is certainly copious Australian evidence to support the conclusion of Chesters, Baxter and Western (2009: 89) that "parenthood is a constraint on equality in the division of labour within Australian households".

The gender discrepancy of unpaid child care applies not only to parents caring for their own children, but also to grandparents providing child care. Australian grandmothers are significantly more likely to report participating in caring for grandchildren than grandfathers are (Condon, Corkindale et al. 2012, Horsfall and Dempsey 2015). It was shown previously (see Figure 3.9) that the bulk of unpaid child care in Australia (excluding care provided by resident parents) is provided by grandparents. Examining the Australians who

report providing unpaid care for children other than their own therefore gives a likely indication of the gender breakdown of grandparents providing unpaid child care. Figure 3.12 illustrates the gender of those Australians who reported providing unpaid child care to children other than their own in the 2011 Census.

Figure 3.12 Australians reporting providing unpaid child care to a child other than their own, 2011



Source: Australian Bureau of Statistics, Census data, 2011

The Census data illustrated in Figure 3.12 show that the caring gender divide is evident in those caring for children that are not their own. Approximately two-thirds of those who reported providing unpaid care to other children are women and only one-third men.

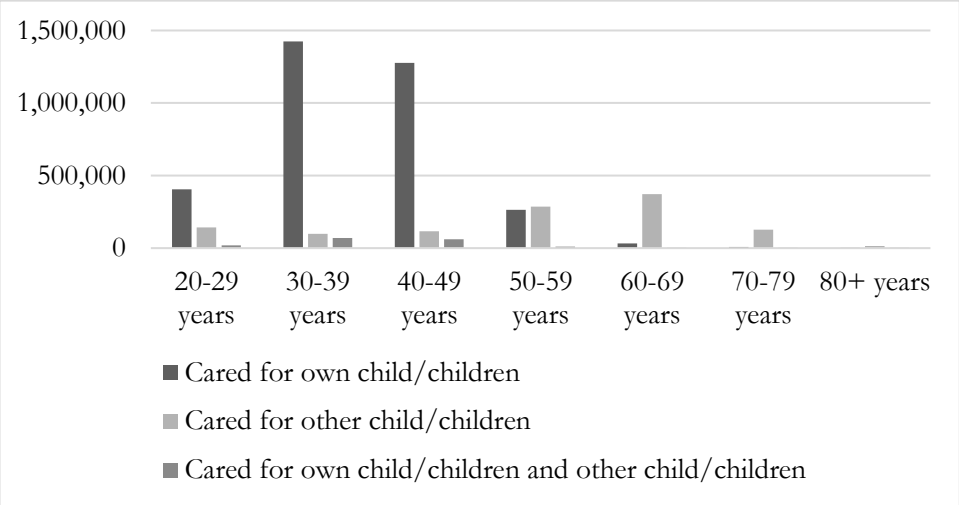
Demonstrably, gender is a clear predictor of the provision of unpaid child care in Australia with women being far more likely to provide care, provide more hours of care and provide more intense care than men. The gender disparity is evident both in parents caring for their own children and in those caring for children other than their own (generally grandparents).

Age

In addition to gender, certain ages appear to be associated with the provision of child care in Australia. It has already been established that the majority of

informal child care in Australia is provided to children by either their own parents or grandparents. It is not surprising then, that the provision of informal child care is strongly predicted by age, with the majority of child carers aged either in their prime parenting or grand-parenting years. Once again, Census data provides the most reliable and representative information regarding the ages of Australians providing informal child care. The age distribution of child carers, illustrated in Figure 3.13 clearly demonstrates the bimodal peaks of age at which Australians were most likely to be caring for children in 2011. The first and biggest peak spans over ages 30 to 49 years and represents parents caring for their own children. The second, much smaller peak, visible at ages 50 to 69 shows those caring for other children, most likely to be grandparents with child care responsibilities.

Figure 3.13 Provision of informal child care by age of carer and child cared for, 2011



Source: Australian Bureau of Statistics, Census 2011, TableBuilder.

The majority of recent examinations of grandparental care in Australia do not provide a breakdown of the age structure of those providing care (Goodfellow and Laverty 2003, Condon, Corkindale et al. 2012, Whelan 2012, Horsfall and Dempsey 2015, Craig and Jenkins 2016a). However, the majority of informal child care provided by non-resident parents comes from

grandparents, therefore the age distribution in Figure 3.13 of people caring for other children is likely to be reasonably representative of grandparents providing child care.

Age is also a relevant variable for predicting child care, not only in terms of the age of the care provider, but the age of the child being cared for. The relationship between the age of the child and the amount of care provided to them was detailed in the previous section 'time spent caring'. It was shown in that section that the age of the child in question is a strong predictor of the time caring, with younger children requiring significantly more hours of care than older children (Craig 2007, Craig and Bittman 2008).

Relationship status and family structure

Relationship status and family structure are associated with the provision of unpaid child care in a number of ways. The first way is straightforward; being partnered and having children are both predictive of having children present, and having children present logically increases the likelihood of providing unpaid child care (because children are the recipients of child care). The number of children present also impacts mothers' and fathers' caring provision differently. Relationship status is also important in terms of the impact of parental separation/divorce on time spent caring for children.

Although ex-nuptial births have increased dramatically since the 1980s (Hayes, Weston et al. 2010), a clear majority - just over two-thirds of children in Australia, are still born to married couples (Australian Bureau of Statistics 2015a). While a significant proportion of the increased ex-nuptial births are to lone mothers, the majority of ex-nuptial births are to co-habiting couples (Vaus 2005), indicating that being partnered is a common characteristic of Australians who have children.

Relationship status is also relevant to the provision of unpaid child care because separated and divorced mothers and fathers report different amounts

of care, both compared to each other and compared to partnered mothers and fathers. Traditionally in Australia, after parental-separation the majority of unpaid child care was provided by mothers who generally had custody of children. Although shared-care arrangements post-separation have increased in Australia, mothers are still more likely than fathers to be primary care providers to children post-separation, and children are more likely to spend more nights with mothers than fathers (Smyth 2004, Weston, Qu et al. 2011).

ABS data support those findings, showing that of the 2.8 million families with children aged 0-17, 81 per cent are couple families and 19 per cent are single parent families. The vast majority of single parent families are lone mother families (approximately 16 per cent of all families with children aged 0-17), compared to lone father families who account for just three per cent of families (Australian Bureau of Statistics 2015c). Approximately one quarter of children of separated parents rarely or never see their fathers.

The number of children a woman has also has significant bearing on her likelihood of forgoing paid work in favour of caring for children. Australian studies such those by as Zhu (2012) and Moschion (2013) find that women with three or more children are significantly less likely to participate in the workforce, and more likely to work fewer hours than women with two children.

There is less evidence available regarding the association between relationship status and child care for grandparents. However, Horsfall and Dempsey (2015) do find that although relationship status has no bearing on the provision of care for grandmothers, grandfathers are more likely to provide care if they are partnered. This finding could suggest that grandfathers rely on their partners to facilitate caring relationships with grandchildren.

Socio-economic status

As was the case for informal carers, the association between child care and socio-economic status can be complex in terms of causality. Specifically, the question here is does increased educational attainment and higher levels of labour force participation reduce the likelihood of having children and providing unpaid care for children? Or, does the presence of children and the unpaid provision of care for those children impact upon educational attainment and labour force participation? Once again, as was the case for informal carers, it is likely to be a mix of the two. Many studies present only correlational data from which information about causality is difficult to ascertain. This section focuses on the ways in which socio-economic status can predict child caring behaviours.

Economic theories such as human capital theory argue that larger the investment an individual has made into their education, the stronger the attachment they will have to the workforce (Mincer and Polacheck 1974). This means that, theoretically, the opportunity cost for highly educated people to become carers is higher than it is for people who have not invested heavily in their own education. Accordingly, human capital theory would predict that women with higher levels of education would be less likely to have children in the first place, and more likely to outsource more of their child care needs than women with lower levels of education (Becker 1981). There is certainly evidence to support aspects of this theory. Australian researchers have demonstrated that increased female educational attainment is associated with increased labour force participation (Evans and Kelley 2008) and decreased fertility (McDonald 2000, Vaus 2002a, Franklin and Tueno 2004, Yu 2006). Yu (2006) explains that the negative correlation between education and fertility for Australian women may not be due simply to the opportunity cost involved, but could also be related to delayed childbearing whilst completing education, resulting in lowered total number of children.

When women have no, or fewer children, it follows that the time they would spend providing unpaid child care is much lower than if they did have children. We can logically assume this is the case for women with no children, and as Zhu (2012) demonstrates; more children means more time providing care (therefore fewer children means less time providing care). Thus, increased levels of female education arguably reduce the likelihood of women providing informal child care.

Although increased female educational attainment may reduce childbearing and therefore provision of unpaid care at a population level, when looking at the educational levels of those who have had children (parents), Australian studies have produced evidence that high levels of educational attainment actually increased the time that mothers time spent with children (Craig 2006c) or found no significant relationship between parental education levels and time spent providing unpaid childcare (Baxter 2010).

It was outlined in the introduction that increased female labour force participation plays a role in delayed childbearing, and subsequent lowering of Australia's total fertility rates (Vaus 2002a). This association is explained by the human capital theory (explained above), that the stronger the attachment to the workforce, the more reluctant women will be to have children. The relationship between employment and the provision of child care is explored in further detail in the impacts of child care section of this chapter.

The employment of a child's parents can also impact the likelihood of that child receiving care from their grandparents. A study by Gray, Mission and Hayes (2005) using data from the Longitudinal Study of Australian Children shows that around one in five young children (infants and those aged four to five years) receive regular care from a grandparent. The vast majority of those cases report that the care is provided to facilitate the work or study commitments of the parents, suggesting that the employment status of the

parents may determine the likelihood of grandparents caring for the grandchildren (Gray, Mission et al. 2005).

In terms of the employment status of grandparents themselves, as might be suspected, those who are either retired or are semi-retired are more likely to provide care to grandchildren than those who are still strongly attached to the labour force (Goodfellow and Laverty 2003, Condon, Corkindale et al. 2012, Horsfall and Dempsey 2015). Condon and Corkindale et al. (2012) found that nearly half of the grandparents they surveyed want more contact with their grandchildren than they currently have, and nearly two-thirds of grandparents feel that their work commitments are an obstacle to achieving the desired amount of contact with their grandchildren.

Overall, the existing Australian literature reviewed here suggests that gender, age, relationship status and socio-economic status all play a role in determining who is likely to provide unpaid child care in Australia.

Impacts of providing child care

This section examines research which explores the effects that providing child care has on Australian. It divides the impacts of providing child care into two key areas; physical and mental health and wellbeing, and economic status. The research reviewed demonstrates that providing child care impacts in different ways for men and women and for parents and grandparents.

Physical and mental health and wellbeing

The impacts of providing unpaid child care on physical and mental health and wellbeing have been documented by a number of Australian studies, often through the lens of parenthood (Hewitt, Baxter et al. 2006, Qu and Vaus 2015).

Qu and De Vaus (2015) demonstrate that while both mothers and fathers tend to experience an increase in life satisfaction before the birth of a child, life satisfaction for both parents declines steadily after the first year of the child's life. The increase in life satisfaction pre-birth and decrease after the first year are both significantly more pronounced for mothers than fathers (Qu and Vaus 2015). Hewitt, Baxter et al (2006) offer another insight into the impacts of parenthood on health and wellbeing. They conclude that having young children (under five years old) is associated with poorer health for men, but not for women. They also find a weak negative effect of having additional children under the age of 18, but only for women in full-time employment. In explaining these impacts of parenting on health and wellbeing, Hewitt, Baxter et al refer to the theories of multiple-role burden and multiple-role attachment. Multiple-role burden is the idea that the pressure and stress associated with increased roles and responsibilities results in negative health outcomes, whereas multiple-role attachment argues that increased roles broaden an individual's support network, with beneficial impacts on health (Hewitt, Baxter et al. 2006). Given their relevance to the provision of dual care, these two theories are explained in more detail in the final section of this chapter.

The provision of child care also has likely impacts on the wellbeing of grandparents. Craig and Jenkins (2016b) find that when grandmothers provide regular care to their grandchildren, their likelihood of reporting high time pressure doubles (compared to grandmothers who are not providing regular care). Interestingly their study reveals no such relationship for grandfathers.

Economic Status

The relationship between economic status and the provision of unpaid child care has received much attention in Australian literature, often with a particular focus on mothers' labour force participation and income. This section examines previous research on the impact of unpaid child care on

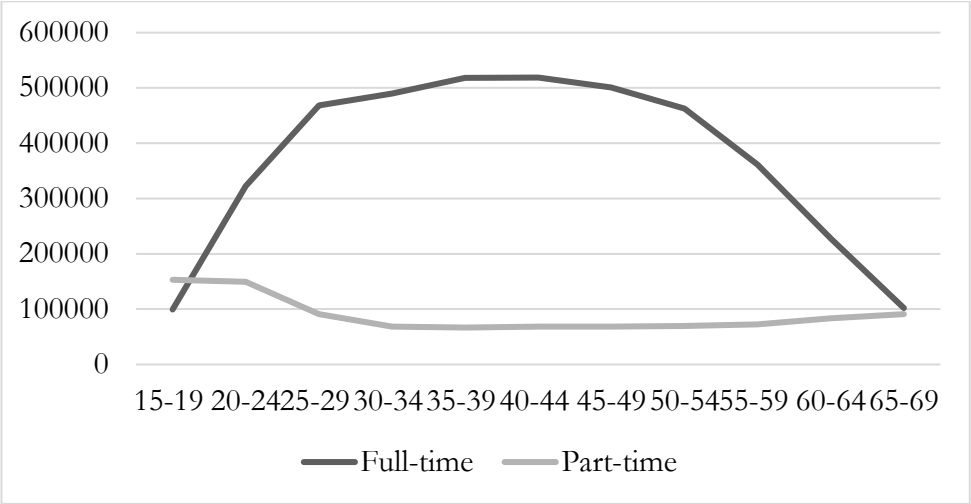
economic status, and demonstrates that the impact differs for men and women, and for parents and grandparents.

Given the generous scholarly attention paid in Australia to maternal employment, it is here that impact of unpaid child care on economic status begins. Maternal employment in Australia has seen considerable growth over the last few decades, however much of this growth has been in part time employment (Evans and Kelley 2008, Hayes, Weston et al. 2010, Baxter 2013c, Baxter 2013b). The increase in part-time employment for Australian women with children has been described as a move from male breadwinner households to one-and-a-half earner households (Craig and Mullan 2009).

One of the key impacts of caring for children is a reduction in time spent in employment for women. Many Australian studies demonstrate that women reduce their hours of work or withdraw from the workforce after the birth of a child (Craig 2006c, Evans and Kelley 2008, Gray, Edwards et al. 2008, Craig and Sawrikar 2009, Gray and Baxter 2010, Parr 2012, Baxter 2013c, Moschion 2013). This effect of reduced labour force participation is greatest when children are at younger ages; as children age, mothers' workforce participation increases (Baxter, Gray et al. 2007, Craig and Sawrikar 2009).

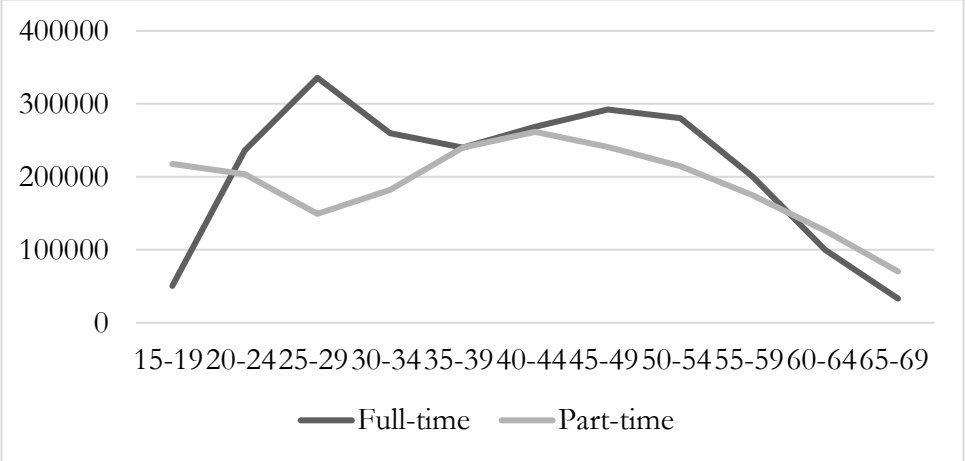
As the aforementioned studies show, the engagement of part-time employment to facilitate unpaid child caring responsibilities is not equally dispersed amongst Australian men and women. Inspection of male and female full-time and part-time labour force participation rates from 2011 Census data (Figure 3.14 & Figure 3.15) clearly illustrates the gender disparity in employment for men and women in Australia across the life course.

Figure 3.14 Men's patterns of full-time and part-time work, by age, 2011



Source: Australian Bureau of Statistics, 2011 Census data, TableBuilder.

Figure 3.15 Women's patterns of full-time and part-time work, by age, 2011



Source: Australian Bureau of Statistics, 2011 Census data, TableBuilder.

Figure 3.14 (men's patterns of work) shows that full-time employment is the norm over the majority of the life course for Australian men. Figure 3.15 shows a very different pattern for women. After ages 25-29 women's full time employment decreases sharply and part-time employment increases correspondingly. The peak of part-time employment reflects the time in the life-cycle that women are most likely to have and be caring for children.

The relationship of this pattern of part-time employment to motherhood and unpaid child care is supported by other researchers such as Baxter (2013c) who, using a confidentialised unit record file from 2011 Census data, show that 45 per cent of employed mothers (with a child aged up to 11 years old) are engaged in part-time work, compared to only 5 per cent of employed fathers.

The reduction in employment of mothers is further illustrated in the work of Moschion (2013). Moschion analyses Australian Census data from 2006 and concludes that having more than one child decreases the labour market participation of mothers by 12 per cent, and reduces their hours worked by four hours per week. Other studies reach similar conclusions that women with more children are less likely to be employed, and more likely to be working fewer hours if they are employed (Birch 2005, Evans and Kelley 2008, Parr 2012).

Given the decline in hours of work associated with caring for children (for women) it follows logically that income of women providing child care is also negatively impacted. The switch to part-time work that is common for so many Australian women on having children is also associated with stalled careers and occupational down-grading (Chalmers 2013), both of which have implications for earning potential beyond hours worked. The relationship between having children and reduced income and future earning potential for women is confirmed by numerous Australian researchers (Breusch and Gray 2004, Chalmers and T.Hill 2007, Charlesworth, Strazdins et al. 2011, Livermore, Rodgers et al. 2011). In addition to lowered employment and incomes, women who provide unpaid child care also face reduced superannuation savings (Parr, Ferris et al. 2007, Smith 2007).

Demonstrably, Australian men and women's employment patterns over the life course vary considerably from one another, and motherhood in Australia is negatively associated with employment, income and superannuation due to

the provision of unpaid child care. Not only do Australian fathers not experience the negative economic associations that women face on having children, some studies have found that fatherhood has positive correlations with employment and income (Charlesworth, Strazdins et al. 2011). The fact that fathers are most frequently involved in full-time employment, whereas mothers have higher rates of part-time employment has already been demonstrated. An examination of the relationship between fatherhood and employment by Gray (2013) moves beyond correlation and finds that after having a first child, Australian men, on average, actually increase their time in paid employment by four and a half hours per week.

Just as the relationship between unpaid child care and economic status differs for men and women; so too does it differ for grandparents. It was argued in the predictors of child care section that economic status of both parents and grandparents can predict caring behaviour for grandparents. Firstly, this means that grandparents are more likely to provide unpaid child care if the child in question's parents are employed. Secondly grandparents who are retired or semi-retired are more likely to be involved in unpaid child care than those who are still employed. Only one existing Australia study was found which investigates the relationship in the other direction, asking how does the provision of unpaid child care by grandparents impact on their labour force participation? Whelan (2012) finds that providing informal care to grandchildren does impact on the labour market activity of grandparents, but not in the way one might expect. His study of HILDA data from 2007 argues that low levels of engagement in caring for grandchildren can have a positive impact on labour force participation (Whelan 2012). There is a lack of longitudinal research into this area which may account for the conflicting conclusions about the relationship between employment status and grandparents' provision of unpaid child care.

Dual care in Australia

The preceding sections of this chapter have demonstrated that there is more than adequate research available regarding informal carers and child carers in Australia, as separate entities. As has been stated numerous times so far, the gap in the literature occurs when informal care and child care are provided concurrently. Although the term 'dual care' was developed specifically as part of this thesis, there is still some Australian research which touches on the concept of increased or combined caring responsibilities. Looking at this research, existing theories about the provision of care, and the separate branches of research into informal care and child care; this section offers some insights as to what the likely predictors and impacts of dual care could be.

Existing Australian research into dual care / increased caring responsibilities

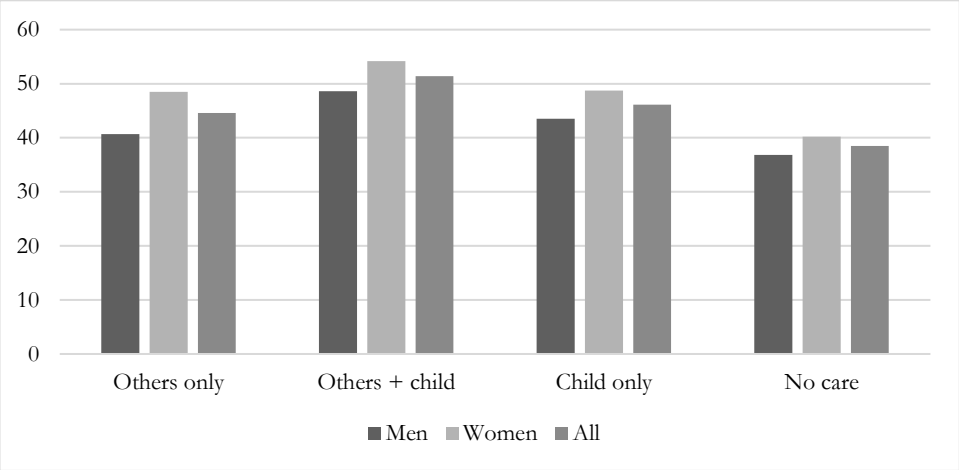
Research into the prevalence, predictors or impacts of dual caring in Australia is sparse. This literature review has identified some areas of Australian research that address aspects of dual care. The first area is research investigating work-life balance in Australia. Though most of this research focuses on the combination of parenting with paid employment, there are some studies which begin to explore increased caring responsibilities. The second area of research to be examined in this section is a paper by Lee and Powers (2002) titled "Number of Social Roles, Health, and Well-being in Three Generations of Australian Women". This paper examines the impacts of occupying a number of different social roles and raises the idea of role overload vs role enhancement. The final branch of research to address dual care is the Families Caring for a Person with a Disability Study (FCPDS) (Edwards, Higgins et al. 2008) which has been discussed previously in the

informal care section of this chapter. These areas of research, and their implications for this thesis will now be discussed.

While there is very little research which addresses the combination of the roles of informal care and child care, there is actually a strong body of Australian investigation into the combination of family responsibilities and employment (Pocock 2003, Pocock 2005, Hewitt, Baxter et al. 2006, Bardoel, Cieri et al. 2008, Pocock, Williams et al. 2012, Skinner, Hutchinson et al. 2012, Pocock, Charlesworth et al. 2013, Skinner and Pocock 2014). This research often falls under the title of 'work/life balance' and it is within this body of research that some of the beginnings of dual care investigations can be found.

Skinner, Hutchinson et.al (2012) briefly describe the impact of combing informal care and child care through their use of the Australian Work and Life Index (AWALI) survey. The work-life index is based on a serious of five measures of self-assessed perceptions of general interference of roles on other areas, time strain, work-to-community interference, satisfaction with overall work-life balance and frequency of feeling rushed or pressed for time (Skinner, Hutchinson et al. 2012). Overall, a higher work-life index score indicates respondents are experiencing high amounts of role-overload and stress from competing demands on their time. Skinner, Hutchinson et al's findings on the reported work-life index for different levels of caring responsibilities are reproduced in Figure 3.16.

Figure 3.16 Work-life index scores by type of care responsibilities and gender



Source: Figure reproduced from Skinner, Hutchinson et al, 2012. p43

Figure 3.16 illustrates an association between providing both informal and child care (i.e. dual care) and reporting higher scores on the work-life index. This lends support to the idea that Australians providing dual care experience role overload, or higher levels of stress than those with less caring responsibilities. The visualisation of work-life index scores also shows that Australian women report higher work-life stress than men in all combinations of caring responsibilities. A more recent publication of the same study (with further waves of the AWALI survey) reports similar findings regarding increased caring responsibilities (Skinner and Pocock 2014). The recent report uses a slightly more limited definition of combined caring responsibilities, only including elder care and child care, whereas the earlier report (illustrated in Figure 3.16) uses a more inclusive informal care and child care combination. Regardless, the recent report echoes previous findings that respondents who report providing both types of care also report higher work-life index scores that those with only one type or no caring responsibilities. In both waves of the AWALI survey, women report more work-life stress than men for all combinations of caring responsibilities. The results from both waves of the

AWALI lend support to the idea of role overload impacting on dual carers, which will be explored in more detail shortly.

Following on from the body of research into work-life balance, there are two other pieces of research that address the impact of increased caring responsibilities in Australia. The first study, by Lee and Powers (2002), explores the impact of multiple social roles on the health and wellbeing of Australian women, using data from the first wave of the Australian Longitudinal Survey on Women's Health. They investigate the impact of five separate social roles; worker, partner, parent, student, and caregiver on three generations of Australian women. Through their analysis of these data, Lee and Powers assess the validity of two theories of the relationship between number of social roles and wellbeing. They refer to these two bodies of thought as the 'scarcity hypothesis' and the 'enhancement hypothesis'. The scarcity hypothesis claims that occupying multiple roles can cause stress, ill-health and reduce well-being due to "an excessive overall workload" or demands of the various roles interfering with each other (Lee and Powers 2002: 196). This ties in with the ideas of role overload theory and time constraints (from the previous discussion of the burden of care). The enhancement hypothesis essentially argues the opposite point to the scarcity hypothesis; claiming that occupying multiple social roles actually improves well-being by providing access to "a range of sources of positive social interaction, pleasurable activity, achievement, and status" (Lee and Powers 2002: 196). The ideas and implications of these conflicting hypotheses are further explored in the theory segment of the dual care section of this chapter.

The study involves over 40,000 respondents – Australian women in three age groups, young (those aged 18-23), mid-aged (40-45) and older (70-75). Lee and Powers find that young women are most likely to have only one role (either student or worker). Just under a third of young women occupy two roles (either student/worker or worker/partner). Mid-age women are most

likely to report three roles (most commonly partner/worker/parent). Older women are restricted in their response categories to only partner and/or caregiver and the most common response for this age group is a single role of partner. Mid-age women report the highest proportion of both parents (64.4 per cent) and caregivers (20.1 per cent). The different number of social roles reported by each age group supports the idea that there are certain characteristics associated with taking on different social roles. In this case, age seems to be a determinant of both the number and types of social roles women are likely to occupy. This finding is supportive of the role of the life course perspective in predicting dual care. This perspective is explored further in the final segment of this chapter.

In terms of the impact of the number of social roles, Lee and Powers find support for both the scarcity and the enhancement hypotheses. Interestingly, the number of social roles occupied impacts the different age groups in very distinct ways. For young women, having either no social roles or three or more roles is associated with the worst outcomes for health and wellbeing. Young women with one social role fare best. For mid-age women, increased social roles are associated with better physical health and occupying one to three roles correlates with the lowest stress and best emotional health. Finally, for older women having one role is consistently associated with better outcomes than having two roles (the maximum allowed for this age group by the survey design).

One of the limitations of Lee and Power's study is the narrowly defined age groups; age groups capturing the full life course would add valuable information and possibly pick up different patterns of role fulfillment and impacts. The age groups are a limitation of the survey data and not an analytical decision of the authors. Additionally, this paper only examines one wave of the survey, meaning their conclusions about impacts are based on correlational data. The paper also does not specifically address women who

combine parenting and caregiving. Lee and Power acknowledge this limitation and reiterate that the focus of their research is the impact of multiple social roles as a whole and not the impact of specific combinations of social roles. Despite these limitations, this paper is one of a select few to address the impact of multiple social roles and as such its contribution to this body of research is valuable.

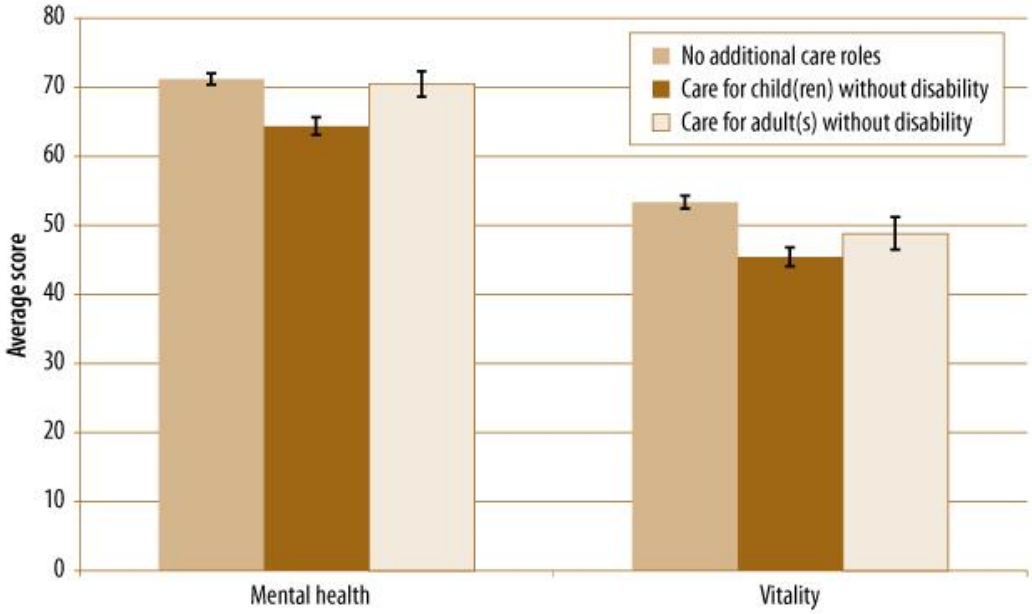
The final piece of research which addresses dual care was referenced multiple times in the informal care section of this chapter. This research is the Families Caring for a Person with a Disability Study (the FCPDS) (Edwards, Higgins et al. 2007, Edwards, Higgins et al. 2008). As well as providing a wealth of information about the provision of informal care in Australia, the FCPDS is one of the select few studies to address the experiences of Australians combining their informal caring role with other child care responsibilities.

The FCPDS data shows that a large proportion of primary carers (nearly one in three) care for at least one child in addition to caring for a person with a disability (Edwards, Higgins et al. 2008). In other words, 31.9 per cent of the informal carers surveyed in the FCPDS are dual carers (as defined in this thesis). This research also explores additional caring responsibilities in terms of informal carers providing care for more than one person with a disability. This type of additional caring responsibility is examined separately from respondents with additional caring responsibilities for children (without disabilities). The report reveals that approximately 13 per cent of the primary carers surveyed provide care for two or three people with a disability.

Edwards, Higgins et al (2008) find informal carers who have additional caring roles for people without a disability to be under more strain than carers without additional care roles. Figure 3.17 shows the differences in mental health and vitality for carers with no additional care roles, with additional care responsibilities for children without disability (dual carers), and with additional care responsibilities for adults without disability. Carers who also care for

children without disabilities score worst out of all three groups for both mental health and vitality. Carers without additional care roles score the best overall. Similar results are reported with regards to the incidence of depression.

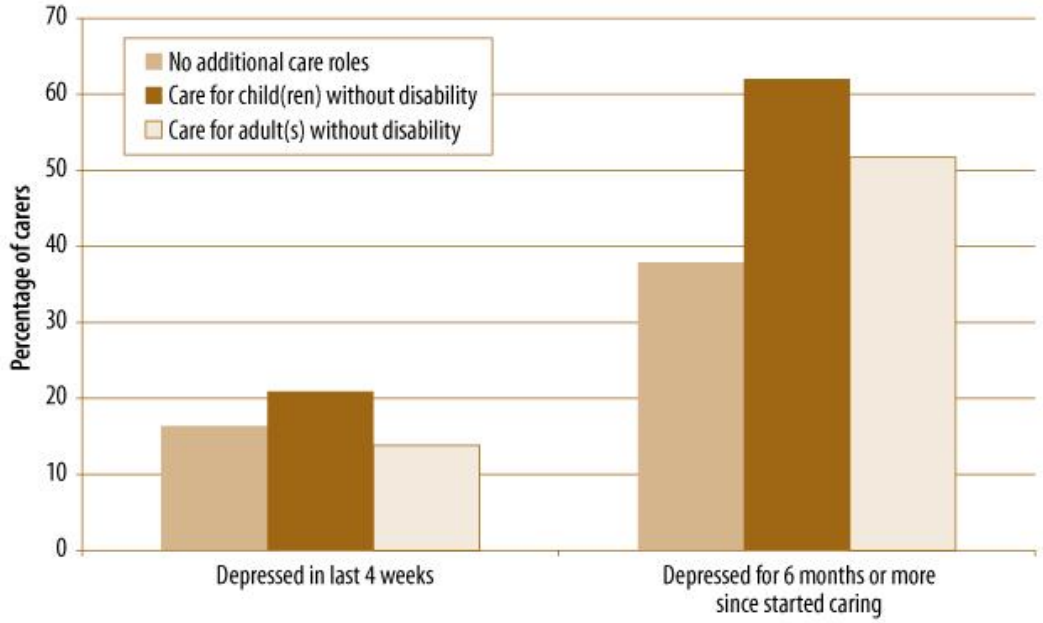
Figure 3.17 Mental Health and Vitality of Carers in the FCPDS Study, by additional caring roles



Source: Figure reproduced from the FCPDS study (Edwards, Higgins et al. 2008)

In addition to examining the self-reported mental health and vitality of carers by additional caring responsibilities, Edwards, Higgins et al. (Edwards, Higgins et al. 2008) also compare the reported occurrence of depression for carers with varying additional caring responsibilities. These comparisons are illustrated in Figure 3.18.

Figure 3.18 Depression of Carers in the FCPDS Study, by additional caring roles



Source: Figure reproduced from the FCPDS study (Edwards, Higgins et al. 2008)

Figure 3.18 demonstrates that carers in the FCPDS who report caring for children in addition to their informal care role are the most likely to report being depressed in the last four weeks, or having been depressed for six months or more since started caring. As was the case in the previous figure, the 'dual carers' seem to be experiencing the strongest negative impact on their mental health, compared to those with no additional caring responsibility and those caring for more than one adult with disability.

Overall, the previous Australian research examined in this section indicates that dual carers may experience 'role overload' from their increased caring responsibilities, more so than other types of multiple role experiences. Unfortunately, given that dual care is not the primary focus of any of the studies examined here, there is little information regarding the other characteristics of dual carers (such as age ranges, socio-economic status and so on). Although limited in the amount of information regarding dual care, the

studies examined above provide a useful point from which to theorize the possible predictors and impacts of dual care.

Theoretical perspectives

There are three theoretical approaches which are relevant for the forthcoming analysis of the predictors and impacts of dual care. These are the life course perspective, gender theories and role overload theory (vs role enhancement). Each approach offers a framework for identifying the likely predictors or impacts of dual care. Specifically, life course theory provides suggestions as to the anticipated predictors of dual care. Gender theories are relevant for speculation of both the predictors and impacts of dual care. Role overload (or enhancement) theory pertains to the likely impacts of dual care. All three theoretical approaches are evident throughout the discussion of the literature previously reviewed in this chapter. However, it is this section which explicitly outlines these approaches and shows how they are relevant to the following analysis of dual care in Australia.

Life course perspective

The life course perspective offers a lens through which to examine the ways people take on and discard various roles as they progress though the life course (Baxter and Evans 2013). The life course is defined as "a sequence of socially defined events and roles that the individual enacts over time" (Giele and Jr. 1998: 22). Within the life course perspective, there are a number of factors which interact with one another, ultimately shaping the events and roles that individuals experience at different points in their individual life courses. These factors can include macro-level phenomena, such as societal structural influences, institutions and the given time period, as well as micro-level, individual factors like age, gender, relationship status etc. The idea that these varied factors can shape, or increase the likelihood of taking on certain roles is an underlying assumption of the majority of the studies examined

throughout this chapter. Australian research also demonstrates that experiencing various life events and roles can impact on life satisfaction and other wellbeing indicators (Moloney, Weston et al. 2012, Qu, Baxter et al. 2012, Qu and Vaus 2015).

Taking on a child care responsibility, particularly becoming a parent, is still considered to be a 'standard' feature of the life course for the majority of individuals living in industrialized, western societies (Thomson, Winkler-Dworak et al. 2013). That said, a number of factors have been identified throughout this chapter which shape the likelihood of Australians experiencing the life event of taking on a child care role. These include being female, being partnered, and being aged 30 – 45 (for parents) and aged 60-69 for grandparents. The literature also shows that taking on the role of a child carer impacts the life course of individuals in other ways, such as the move to part-time employment for women when they provide child care to young children.

Becoming an informal carer is a much less common life event, but as is the case for child care, progression through the life course to this particular role is still shaped by many other factors. These predictors of informal care include being female, being partnered, being aged 55 to 64 (for women) and aged over 75 for men, and having lower levels of educational attainment. A number of more macro-level factors were also identified in the introduction chapter of this thesis as shaping the probability of Australians becoming informal carers. These factors included the demographic trends of the ageing of the population and the obesity epidemic (and subsequent increasing disability rates). The move away from institutional care of Australians living with disability and long-term health problems is another structural change which impacts the life course trajectories of many Australians by increasing the likelihood that they will become informal carers (Brennan 2007).

The life course perspective offers a way to understand progression through the life course to the roles of child care and informal care. As such, it is a tool which allows us to make inferences about who may experience the life event of becoming a dual carer. Given the insights about the provision of informal care and child care, it is likely that age, gender and relationship status will all have clear associations with the provision of dual care (specifically being in the child-rearing years, being female and being partnered). It is also probable that taking on the dual caring role will impact other life course events. A likely arena for this is the reduction of employment (particularly for female dual carers).

Gender theories

A clear feature of the examination of the provision of both informal care and child care is the issue of gender. Without a doubt, the provision of both types of care are dominated by women. It was also shown that informal care and child care impact differently on the women who provide them (compared to the men providing each type of care).

One of the primary aims of gender theories is to offer ways of examining inequalities in societies relating to gender. An in-depth exploration of gender theories relating specifically to the provision of care was provided in the earlier discussion of the provision of informal care. To briefly summarize those approaches; the 'ethic of care' approach postulates that women are more likely to take on caring responsibilities because they have an inherent ethic of value which focuses on and values the care of others (Gilligan 1982). Men, according to this approach, do not have this focus. There are obvious problems with this approach, however other researchers have further developed it, arguing that rather than having an inherent 'feminine morality', women are actually socialised into being the care providers of society, forcing them to provide care to those around them, even when the provision of care is to their own detriment (Stohs 1994, Kittay 1999, Tronto 2001, Hales 2007).

A lack of choice regarding the provision of care is one of the key factors in experiencing care as a 'burden' according to Braithwaite (1990, 1992). Societal expectation or constraint pushing women to provide care without much choice could offer a potential explanation as to why the provision of care impacts upon women disproportionately.

The examination of the existing research on the provision of informal care and child care demonstrates clearly that the gender disparity in both realms of care is still dominant in modern Australia. It has also shown that the provision of care has disproportionately negative impacts on women, specifically in the areas of employment and health and wellbeing. Application of the ideas of gender theories of care to dual carers suggests strongly that the provision of dual care will be primarily by women, and the impacts of providing dual care are likely to effect women disproportionately.

Role overload vs role enhancement theories

The competing theories of role overload and role enhancement have been discussed at numerous points in this chapter. Role overload is, at times, referred to as multiple-role burden (Hewitt, Baxter et al. 2006) or the scarcity hypothesis (Lee and Powers 2002). Correspondingly, role enhancement theory is also referred to as multiple-role attachment (Hewitt, Baxter et al. 2006) or the enhancement hypothesis (Lee and Powers 2002).

These two competing theories have been outlined previously in this chapter, however, their main arguments are reiterated here. Also used in a number of studies of work performance in specific professional settings (Peterson, Smith et al. 1995, Jones, Chonko et al. 2007), role overload theory argues that when an individual has an increasing number of social roles or responsibilities to perform, the resulting stress can have negative impacts on other areas, in particular on physical and mental health and wellbeing (Coverman 1989). Those negative impacts can, in turn, have their own flow-on effects into other

areas, such as employment or relationships. The relevance of role overload theory to the provision of informal care and child care has already been demonstrated. Role overload theory is even more relevant to the provision of dual care, as dual carers are, by definition, experiencing a more substantial load of social roles than informal carers or child carers alone. Role overload theory would suggest that dual carers will experience poorer levels of physical and mental health and wellbeing than the general population, those providing only informal care, and those providing only child care.

As with the application of gender theories to the provision of care, Braithwaite's (1990, 1992) crises of decline are relevant to the theory of role overload. Although Braithwaite's conceptualisation of care as a burden is demonstrably problematic, time constraints remains a useful and less polarising way of understanding why the provision of care often comes with negative effects. As Braithwaite argues, the provision of informal care takes a lot of time, and can cause conflict with other roles or activities that the care provider needs (or wants) to undertake. This is also relevant for those with child caring responsibilities. This lens of time constraint clearly links to the theory of role overload and is particularly useful for speculating what the impacts of dual care could be. Given the idea that the increased time constraints have a negative impact on those with either informal caring or child caring responsibilities, it is reasonable to assume that the impact of dual caring will be even stronger.

In stark contrast to role overload theory is role enhancement theory. Where role overload argues that the fulfilment of multiple roles creates pressure and negative impacts, role enhancement claims that increased roles and responsibilities can have a positive impact (Rozario, Morrow-Howell et al. 2004). There are multiple mechanisms through which role enhancement argues this positive impact occurs. These mechanisms include; access to a wider support network, being more engaged with the community, having a

feeling of being productive, and feeling that the roles performed have a positive impact on others (Reid and Hardy 1999, Lee and Powers 2002, Rozario, Morrow-Howell et al. 2004, Hewitt, Baxter et al. 2006). Looking through the lens of role enhancement theory, the provision of dual care could have positive impacts on the health and wellbeing of dual carers. As a result of their increased caring roles, dual carers could potentially experience more positive impacts than those with no caring responsibilities, those with just informal caring responsibilities and those with only child care responsibilities.

Conclusion

Although there is a wide body of Australian literature detailing the predictors and impacts of informal care and child care as separate concepts, there is a significant gap in the literature when it comes to addressing those who occupy both child care and informal care roles – the dual carers. This chapter has comprehensively examined and critiqued the existing research on both informal care and child care in Australia. This led to an exploration of the very small amount of research which touches on dual care in Australia. The chapter concludes with relevant theoretical insights about what the predictors of dual care in Australia could be, given what is already known about the provision of informal care and child care separately.

The first key finding of the literature reviewed in the informal care section of this chapter is that certain characteristics are associated with an increased likelihood of providing informal care. These predictors of informal care include being female, being partnered, being aged 55 to 64 (for women) and aged over 75 for men, and having lower levels of educational attainment. Though there is still much conjecture about correlation and causation, it was also shown that informal caring likely impacts on informal carers in terms of reducing income and employment, increasing relationship breakdown and reducing physical and mental health and well-being. It was suggested that

more qualitative research would be needed to properly investigate the positive impacts of providing informal care.

The reviewed research regarding the provision of child care in Australia shows that many of the predictors are the same as they are for informal care. Being female, being partnered, and being aged 30 – 45 (for parents) and aged 60-69 for grandparents are all associated with higher rates of providing unpaid child care. Education and employment have more complicated relationships, as is the case for informal care. Men and women appear to experience different impacts of providing child care, as do parents and grandparents.

A small amount of research was identified which began to explore the provision of dual care in Australia. This research not only highlighted the gap in the existing literature but, coupled with the research examined for informal care and child care separately, also indicated that life course theory, gender theories and role overload or role enhancement theories could be useful in explaining the anticipated predictors and impacts of dual care to be analysed in the remainder of this thesis.

Chapter Four – Data

Introduction

In order to address the research questions outlined in earlier chapters, this thesis draws on two key data sources. The first, and most frequently used data source is the Household Income and Labour Dynamics in Australia (HILDA) survey. The second data source is the 2011 Australian Census. This chapter provides detailed information about each of these sources. More attention is paid to HILDA; this is due to its status as the primary data source, its complexity as a longitudinal survey and the significant amount of changes made to the construction of variables. In addition to the general description of each data source, operational definitions and the construction of key variables are presented. The discussions of both data sources conclude with an examination of the unique limitations faced by each.

Although the specific analytic techniques used throughout the thesis are outlined in this chapter, in depth discussion of those methods will be found in the beginning of each corresponding result chapter. This is because the analytical approaches vary from chapter to chapter. The overview of methods begins with the rationale for choosing quantitative analysis over a qualitative or mixed methods approach. The additional benefits of longitudinal data and analysis over cross sectional analyses will then be presented. The chapter concludes with a brief examination of event-history analysis and multilevel modelling, focusing on the ways in which those approaches allow the original research questions to be answered.

The primary data source - HILDA

Introducing HILDA

The key data source used throughout this thesis is the Household, Income and Labour Dynamics in Australia survey, commonly known and referred to as HILDA. HILDA is a nationally representative, annual, longitudinal survey that has been running since 2001.

The first wave of this household-based panel survey consists of 7,682 households and 19,914 individuals. Over the course of the survey, HILDA continues to survey as many of those original respondents as possible, as well as interviewing new respondents when they enter the households of existing respondents. HILDA also tops up the original sample with an additional 2,153 households and 5,477 individuals in wave 11 (2011). The key rationale for including the top-up sample is increasing the representation of under-represented groups, such as immigrants arriving in Australia after the commencement of the HILDA survey in 2001 (Summerfield, Freidin et al. 2014). Information regarding the number of respondents and sample retention is presented in Table 4.1.

Table 4.1 Household, Income and Labour Dynamics in Australia survey information

		Sample size		Sample retention	
	Year conducted	Households	Individuals	Previous wave retention (%)	No. of Wave 1 respondents
Wave 1	2001	7,682	13,969	-	13,969
Wave 2	2002	7,245	13,041	86.9	11,993
Wave 3	2003	7,096	12,728	90.4	11,190
Wave 4	2004	6,987	12,408	91.6	10,565
Wave 5	2005	7,125	12,759	94.4	10,392
Wave 6	2006	7,139	12,905	94.9	10,085
Wave 7	2007	7,063	12,789	94.7	9,628
Wave 8	2008	7,006	12,785	95.2	9,354
Wave 9	2009	7,234	13,301	96.3	9,245
Wave 10	2010	7,317	13,526	96.4	9,002
Wave 11	2011	9,543	17,612	96.5	8,780
Wave 12	2012	9,537	17,472	96.2	8,543
Wave 13	2013	9,555	17,501	96.4	8,301

Sources: HILDA data, HILDA user manual, HILDA website

The use of HILDA data in this thesis

HILDA was chosen as the primary data source for this thesis for two key reasons. The first is the fact that it is a quantitative and nationally representative sample. This means the results of the analysis of this data are applicable to Australian population as a whole. The second crucial reason that HILDA was chosen is because it is longitudinal. As is explained further in a later section of this chapter, longitudinal analysis provides an opportunity to move from the basic correlational insights of cross sectional data and analysis, and into the area of causation.

Data from HILDA is analysed in all three results chapters of this thesis, with each chapter using HILDA data in a different way to answer different research questions. Chapter Five – "Illustrating Dual Care in Australia"

describes the situation of dual care in Australia. It presents cross sectional data from HILDA to show the relationships between a number of variables and caring status without making statements about causation. As such, the data used from HILDA in Chapter Five presents descriptive quantitative analyses, including frequencies, cross tabulations and averages. Chapter Five also uses HILDA data in a longitudinal sense, firstly for an examination of patterns of caring over time. It also presents an examination of spells of caring (the length of time people provide different kinds of care for). Finally, it investigates entry into dual care, which involves examining people's caring status immediately preceding their dual care responsibilities.

Chapter Six – "Predicting Dual Care in Australia" analyses the ways in which different characteristics can predict different caring responsibilities. The analytical approach used in Chapter Six is event-history analysis, which is a longitudinal technique. As such, that analysis draws on HILDA data from wave five to wave 13.

Chapter Seven - "The Impacts of Dual Care in Australia" is based on another longitudinal analytical technique; multilevel modelling, which uncovers and examines the different ways that different caring responsibilities impact upon Australians. Like the analysis presented in Chapter Six, the analysis of Chapter Seven draws on HILDA data in a longitudinal sense, using data from waves five to 13.

For the purpose of longitudinal analysis, the HILDA data is stored in the 'person-period' format, often referred to as 'long'. A person-period data set is one in which there are multiple records for each respondent (Singer and Willett 2003). Every time that a respondent is measured they generate a new record; these multiple records for each person are identified in the HILDA data by a cross wave identification number.

Most of the analysis in this thesis uses multiple waves of HILDA data, specifically waves five to 13 (inclusive). Data prior to wave five are excluded because those earlier waves of HILDA did not ask respondents about informal caring responsibilities in a meaningful way. In the first five waves of the survey respondents are asked if they received a carer's allowance, but they are not explicitly asked if they provide informal care. Using receipt of a carer's allowance as a proxy for provision of informal care would severely underestimate the number of informal carers, given the simple fact that many informal carers are not in receipt of the carer's allowance. In 2012-13 only 563,079 Australians received the carer's allowance (Australian Government Department of Families 2013), which is a very small proportion of the 2.7 million informal carers identified by the 2012 Survey of Disability, Ageing and Carers (SDAC) (Australian Bureau of Statistics 2013l). All waves from wave five explicitly ask respondents if they provide informal care, which is why the decision was made to exclude the first five waves of data.

HILDA is a household panel survey. As such it contains information about individual respondents as well as information about households. The analysis in this thesis uses information from individual respondents, not household information. Data are therefore drawn from the 'responding person' files. The household files of HILDA are a valuable resource for many Australian researchers, providing a wealth of information, including the ability to link the responses of individuals within the same households. However, household data are not required for the analysis conducted in this thesis as the relevant questions are covered in the individual questionnaire.

Variables of interest

The primary variable used in this thesis is dual caring status, and to a lesser extent, informal caring, child caring and non-caring. The operational definitions, creation and source questions of those caring variables will now be presented in detail. The same information (on a smaller scale) will also be

provided for the other administrative, demographic, socio-economic and health and well-being variables.

Caring variables

HILDA respondents are asked two questions about their informal caring responsibilities. Firstly, they are asked if they provide regular, ongoing informal care to someone living in the same household who required assistance due to disabilities, long term health issues or being frail aged. Respondents are then asked if they have provided the same kind of care to someone living elsewhere. If they respondent yes to either question, they are asked to state the nature of the relationship they have with the recipient of the care. The choices are;

- Spouse/partner
- Parent(s)
- Parent(s)-in-law
- Adult child (aged 15+)
- Young child
- Other relative
- Other unrelated person

Respondents are also asked if they are the person who provides most of the care to the recipient referred to. Within each question, respondents are not given the option to state that they provide care to more than one recipient. All respondents who answered yes to one or both of the original provision of informal care questions were coded as being informal carers in a dichotomous informal care variable.

HILDA respondents are asked explicitly if they have parental responsibility for any children in the self-completion questionnaire (the SCQ). Unfortunately, the overall completion rates for the SCQ are only around 88

per cent in recent waves, and are lower for certain sub-groups of the sample, such as those completing interviews by telephone (Watson and Wooden 2015). Given the reduced response rates of the SCQ I made the decision to base the provision of child care variable on data found in the standard survey. In the standard responding person survey, all respondents are asked about the presence, number and age of children residing in the household. The data contains a derived variable from this information, entitled 'total number of own resident children'. This variable is used as a proxy for child care responsibility. Responses from this derived variable are cross checked with the data available from the parental responsibility variable in the SCQ, the correlation between the two is clear enough that presence of children in the household is an acceptable proxy. All respondents who report having a resident child aged 15 or younger in their household are coded as having a child care responsibility.

There are two key limitations associated with using this variable to determine child care responsibilities. As a proxy variable it is an approximation and not an exact measurement. Firstly, it may overestimate child care by including some respondents who live with their own children but have no involvement in their care. Secondly, it excludes those who provide care to children but who do not live with them (this is particularly an issue for grandparents providing regular unpaid child care). The first issue has been addressed by cross checking with variables from the SCQ, and this does not appear to be a problem. Unfortunately, the second issue remains a limitation of the research. HILDA does ask about the provision of child care from grandparents, but only in wave 8. As such, the longitudinal analyses found in Chapters Six and Seven are unable to include grandparents providing child care or dual care. In those analyses, it is therefore important to remember that the child care variable is a conservative estimate. Chapter Five does address the provision of child care by grandparents by including cross sectional analysis using data from the Census.

The dual caring variable is created using the previously described informal care and child care variables. Dual carers are identified by meeting the criteria for being both an informal carer and a child carer at the same point in time. The only caveat regards those who only report one informal caring responsibility to their own child who lived in the same house. These respondents must also have more than one child under the age of 15 living in their household. This is to ensure that all dual carers have at least one informal caring responsibility and at least one additional child care responsibility.

Respondents are defined as having no caring responsibilities if they do not meet the criteria for any of the previous caring variables; that is, they do not provide informal care, they do not provide child care and they do not provide dual care. Depending on the question, information from the aforementioned variables is at times coded as one variable with four response categories (dual care, informal care, child care, no care) or as a series of separate dichotomous variables with all other responses as the '0' category. The exact structure of the caring variables will be explicitly stated in each results chapter.

Operational definitions

The operational definitions of each type of caring responsibility illustrate exactly how each one is defined within the data source. For the HILDA data the operational definitions for the caring responsibilities are as follows:

Informal caring responsibility:

- Provides regular, ongoing informal care to someone living in the same household or living elsewhere, who required assistance due to disabilities, long term health issues or being frail aged.

Child care responsibility:

- Has at least one resident child aged 15 years or younger living in the same household

Dual caring responsibility:

- Provides regular, ongoing informal care to someone living in the same household or living elsewhere, who required assistance due to disabilities, long term health issues or being frail aged, ***and;***
- Has at least one resident child aged 15 years or younger living in the same household, ***and;***
- If the informal caring responsibility is to a young child who lives in the same household, dual carers must also have more than one resident child aged 15 years or younger.

No caring responsibilities:

- Does **not** provide regular, ongoing informal care to someone living in the same household or living elsewhere, who required assistance due to disabilities, long term health issues or being frail aged, ***and;***
- Does **not** have any resident children aged 15 years or younger living in the same household.

In addition to the variables addressing caring responsibilities, there are a large number of variables used throughout the analysis presented in this thesis. Table 4.2 summarises the other key variables used, providing brief information about each one.

Table 4.2 HILDA Variables used in analyses

Variable	Response categories	Description
Administrative variables		
Cross wave ID		Unique identification number for each respondent
Time	2005-2013	Year of survey
Inverse count		The inverse of the number of waves that a respondent has participated in
Demographic variables		
Age	15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75 up	Respondent's age at June 30th of each current year, ten-year age groups
Sex	Female, male	Dichotomous variable
Relationship status	Living with a partner, not living with a partner	Dichotomous variable
Country of birth	Born in Australia, not born in Australia	Dichotomous variable
English proficiency	Speaks English well, does not speak English well	Dichotomous variable
Aboriginal and Torres Strait Islander status	Identifies as Aboriginal or Torres Strait Islander, does not identify as Aboriginal or Torres Strait Islander	Dichotomous variable
Type of area lived in	City area, regional area, remote area	Also coded as individual dichotomous variables
Socio-economic variables		
Disposable income	Income quintiles	Also used as a continuous variable

Employment status	Employed full-time, employed part-time, unemployed, not in the labour force	Current employment status, also coded as individual dichotomous variables
Education	Did not finish Year 12, Finished Year 12, Certificate or diploma, Bachelor's degree or higher	Highest level of education attained, also coded as individual dichotomous variables
Health and wellbeing variables		
Physical functioning	0-100	Derived variable from multiple questions assessing physical functioning
Bodily pain	0-100	Derived variable from multiple questions assessing bodily pain in the last four weeks
Vitality	0-100	Derived variable from multiple questions assessing vitality
General health and wellbeing	0-100	Derived variable from multiple questions assessing general health and wellbeing
Mental health	0-100	Derived variable from multiple questions assessing mental health
Emotional health	0-100	Derived variable from multiple questions assessing emotional health
Social functioning	0-100	Derived variable multiple questions assessing social functioning
Psychological distress	0-100	Derived from multiple questions from Kessler psychological distress scale
Life satisfaction		
General life satisfaction	0-10	Self-rated satisfaction on a continuous scale
Satisfaction with free time	0-10	Self-rated satisfaction on a continuous scale
Satisfaction with health	0-10	Self-rated satisfaction on a continuous scale
Satisfaction with employment opportunities	0-10	Self-rated satisfaction on a continuous scale
Satisfaction with financial situation	0-10	Self-rated satisfaction on a continuous scale

Satisfaction with the home lived in	0-10	Self-rated satisfaction on a continuous scale
Satisfaction with feeling safe	0-10	Self-rated satisfaction on a continuous scale
Satisfaction with feeling part of the local community	0-10	Self-rated satisfaction on a continuous scale
Satisfaction with the neighbourhood lived in	0-10	Self-rated satisfaction on a continuous scale

Data weights

This thesis has used HILDA data weights where appropriate in cross sectional analyses. The longitudinal analyses presented throughout the thesis do not use data weights. Detailed information on the use of data weights can be found in Appendix 1.

Limitations of the HILDA data set

The HILDA survey is an incredibly valuable resource for this research. However, even the highest quality data sets still have their own unique limitations which should be acknowledged. The following section outlines some of the limitations that HILDA should be considered. Specifically, the issues of attrition, measurement of care and order of events between time points are discussed here.

Attrition

HILDA is an 'unbalanced sample'. This means that respondents can be present in either some or all years of data collection. Unfortunately, attrition (or unbalanced data) is almost always an issue for longitudinal surveys (Winkels and Withers 2000). Respondents move, get sick, get too busy, or simply lose interest in responding to the survey. If required HILDA can be transformed into a balanced sample by removing all respondents who are not

present for every wave. Switching to the 'balanced' version of the HILDA data does nothing to solve the actual problem of missing data, it simply hides the missing respondents by removing them from the data set completely. Transforming the data can therefore simplify analysis, but it does so at the cost of introducing selection effects. I chose to leave the data unbalanced to reduce the risk of losing important information and representativeness. This is especially important for my analysis because respondents identifying as dual carers, informal carers or child carers may be more likely to drop in and out of the survey. It was established during the literature review that the provision of all types of caring responsibilities are associated with increased levels of stress and a reduction in free time. It is also well established that panel attrition can cause bias due to certain groups of people being less likely to participate in surveys, or participating briefly in longitudinal surveys but dropping out before they are complete (Duncan 2000). By excluding all respondents with missing waves, I could exclude the very people I am interested in. Using an unbalanced panel does not completely solve the problem of non-random missingness, but it does assist in retaining as much information as possible about those people who are not present for the entirety of the survey.

As was illustrated in Table 4.1, the HILDA data actually has very good ongoing response rates. Most longitudinal surveys experience high levels of attrition over time and it is not uncommon for panel surveys to finish with around 60 per cent of their original respondents (Winkels and Withers 2000). HILDA consistently retains over 90 per cent of the previous wave's sample, leaving wave 13 with a similar proportion of original respondents (see Table 4.1 Household, Income and Labour Dynamics in Australia survey information). Therefore, in dealing with attrition, it should be recognised that HILDA does well in retaining its respondents. It is also important to acknowledge that while missing respondents could be an issue, it is no more of an issue for this thesis than it is for any research which draws on longitudinal data.

Measurement of care

It was argued in the literature review that identifying carers is not always a straightforward activity. People who may fit the definition of providing care may not self-identify as such because they feel it could reduce the complexity of the relationship. This idea of losing or minimising the complexity of caring relationships has been discussed in Chapter Two – The Concept of Care. It was argued in this chapter that caring as a concept in Australia is still seen through the carer-dependent paradigm. Essentially this understanding of care frames it as something that is done by the active carer to the passive care recipient, which can result in many people being reluctant to identify as carers. If this is the common understanding of what care is, it is no wonder that many people do not identify with it. For many, identifying as a carer would therefore imply that they accept the carer-active, recipient-dependent roles as being representative of their much more complex and rich caring relationships.

The fact that carer identification is a problem is in no way the fault of the HILDA survey creators. In fact, the way in which they ask about carer status goes some way toward avoiding this problem. Rather than simply asking respondents if they are carers, HILDA asks if they provide regular, ongoing informal care to someone living in the same household or living elsewhere, who required assistance due to disabilities, long term health issues or being frail aged. Nonetheless, there will still be people who simply see their caring activities as part of their relationships with spouses, children, parents and friends and therefore do not report their caring responsibilities. For this reason, although HILDA takes meaningful steps towards encouraging people to correctly identify themselves as carers, there will likely always be some level of under reporting of caring. Coupled with the previously discussed limitation of respondents dropping out of the survey suggests that it is more than likely

that this research will underestimation the number of carers in general and the number of dual carers in particular.

In addition to this more abstract concern regarding missing informal care providers, HILDA data is also limited in the way it allows identification of those with child care responsibilities. As was fully explained earlier, this limitation is addressed by using a proxy for the provision of unpaid child care.

Order of events between time points

HILDA is an annually conducted longitudinal survey, which means that between each time point for each respondent there is approximately one year. One issue that this raises for analysis is that a number of responses or characteristics could change in between two time points and the researcher will not be able to tell which change occurred first. In the analysis, it will appear as though both events happen at the same time. This is not a minor issue as it disrupts the ability of the analysis and the researcher to ascertain causality or at least the true order of events. This problem has also been referred to as reciprocal causation or endogeneity (Singer and Willett 2003:177)

To fully understand this issue, it is useful to provide an example of what may happen. Take, for example a hypothetical HILDA respondent who, in 2005 is working part-time, caring for a resident child and reporting high levels of good health. In the next wave of data collection (2006) that same respondent is a dual carer, out of the workforce and reporting poor health. The problem of order of events means that the researcher has no way of knowing what order those events happened in. Did the respondent leave work because of their increased caring responsibilities? Or did they become a dual carer because they lost their job? Did their increased caring responsibilities impact upon their health? Regrettably, there is no way of obtaining this information when the changes occurred between data collection points. One of the

potential ways to deal with this problem is by linking prior status of a predictor variable to the current status of the outcome variable (Singer and Willett 2003). This is done in practice by creating 'lag' variables which refer to the status of the predictor variable in the previous wave of data. Both the event-history analysis and the multilevel modelling trialled the use of lag variables. In the event-history analysis, the 'lagged' variables were the various demographic and socio-economic variables whose predictive power regarding caring responsibilities were being investigated. In the multilevel modelling analysis caring status was lagged to explore its impact on other variables. In both cases, use of the lagged variables generally returned weaker but still significant results, comparable to the results using non-lagged (contemporaneous) variables. For this reason, I made the decision to proceed with the use of contemporaneous predictor variables in both sets of analyses. This decision is discussed in further detail in each result chapter.

Census of Population and Housing

Introducing Census

The second data source used in this research is the Australian Census of Population and Housing from 2011. Commonly referred to simply as the Census, it aims to "accurately measure the number and key characteristics of people who are in Australia on Census Night, and of the dwellings in which they live" (Australian Bureau of Statistics 2013b). All Australians and those living in Australia at the time of the census are legally required to participate in the census, excepting only foreign diplomats and their families. Census data is therefore very useful because, unlike other surveys which collect samples of the population, it attempts to capture the entirety of the Australian population.

The first Australian Census was held in 1911, and it was conducted sporadically until 1961. Since 1961 the Census has been held every five years.

At the time of writing Census data collection was still on-going for 2016, amid fears regarding data security and technical issues with the roll out of online collection forms (Biddle 2016, Henderson, Anderson et al. 2016, Smethurst 2016). Although these issues may cause concern for future research using Census data, they do not impact upon this research as it uses data from the 2011 Census only (which is the most recent Australian Census data currently available).

The use of Census data in this thesis

The use of Census data in this research is much more straightforward than the use of HILDA data. Although the Census is conducted every five years, access to linked longitudinal data is not publicly available. As such, only data from 2011 will be examined in this thesis. The results of this analysis are presented Chapter Five – Illustrating Dual Care in Australia.

The 2011 Census data is accessed and analysed using the Census Table Builder Pro application. The Table Builder Pro provides access to five separate databases. This thesis makes use of the database 'Counting Persons, Place of Usual Residence'. As indicated by its title, this database contains only personal characteristics and allows researchers to count people in the place that they usually live. It is necessary to access Table Builder Pro in the place of Table Builder Basic because the Basic application does not allow cross tabulations of different Census categories. This means (among other things) that researchers using Table Builder Basic can access the number of informal carers *or* the number of child carers, but not the number of those who provide both types of care at the same time. In order to access the number of Australians occupying more than one caring role at a time (i.e. dual carers), as well as other cross tabulations, Table Builder Pro is used.

Variables of interest

The given format of Census variables requires (and allows) little change. However, it should also be noted that the lack of complexity of the analysis to be performed on the Census data means few changes are required for analysis anyway. The following section outlines the variables used from the Census data, with particular focus on how they differ from the variables used from HILDA.

Caring variables

As was the case with HILDA data, it is variables which ask about the provision of various types of care which are the main area of interest to this research. In the 2011 Census, Australians are asked a number of useful questions about their caring responsibilities.

In regards to the provision of informal care, Census asks Australians "In the last two weeks, did the person spend time providing unpaid care, help or assistance to family members or others due to a disability, a long term illness or problems related to old age?" (Australian Bureau of Statistics 2011a). The question also explicitly states that care work provided through a voluntary organisation or group should not be included. Those who respond in the affirmative to this question are defined as informal carers.

When investigating the provision of unpaid child care in Australia, the Census asks: "In the last two weeks, did the person spend time looking after a child, without pay?" (Australian Bureau of Statistics 2011a). Respondents are instructed to only include child care provided to a child aged less than 15 years old. Australians who report that they do provide this kind of care are defined as child carers. They are also asked to clarify if the care is provided to their own child, or to a child other than their own (respondents are also able to report providing both types). Both the informal care and child care questions differ from their counterparts in HILDA in that they would only capture

people who have provided care in the last two weeks (without regards to whether or not the care may be ongoing). While this may result in a small percentage of extra (non-ongoing) carers being identified in the Census data (as opposed to HILDA) the majority of respondents who do provide regular, ongoing care are likely to have been captured. This is simply because if they are providing regular ongoing care, then they are very likely to have done so in the previous two weeks.

Responses from the two aforementioned questions are considered together to create the dual caring measure for the Census data. If a respondent reports providing both types of care, then they are considered to be a dual carer. Because there is no proxy needed to measure the provision of child care, the measurement of both the provision of child care and the provision of dual care are much more encompassing in the Census data than they are in the corresponding measures in the HILDA data. Specifically, grandparents providing child care (and dual care) are likely to caught in the Census data where they were excluded by HILDA. It was expected (and is the result) that because of this inclusion the proportion of the population providing dual care appears higher when inspecting results using the Census data.

Demographic variables

For comparative purposes, I align the Census variables used with the HILDA variables previously outlined where possible. The demographic variables used from Census data include age, sex, relationship status, country of birth, English proficiency, Aboriginal or Torres Strait Islander status and city/rural/regional dwelling. [4]

[4] The variables used from the Census were not created, manipulated or changed for this research. Because the variables offered by Census data (within the Table Builder Pro application) are used in the format provided, there is no need to discuss variable construction in depth.

Age is provided both as a continuous variable, and as age groups in ten-year increments. The age groups in the Census data are slightly different to those in HILDA. They are grouped as 20-29, 30-39, 40-49, 50-59, 60-69, 70-79 and 80 and over. The measurement of sex is straightforward with male or female as the response categories. For relationship status I use the 'social marital status' measurement, as opposed to the registered marital status measurement. This is more comparable with the relationship status variable in the HILDA data which recodes respondents as living with a partner or not living with a partner. I have defined the Census data on relationship status as 'partnered' being those in either a registered marriage or a de facto marriage and 'not partnered' as those who respond either not married or not applicable.

For the country of birth measurement, I group those born in Australia as one, and those born in any other country as not born in Australia. For English proficiency, I group those who report speaking English very well and well as speaking English well. Those who report not speaking English well and not at all are grouped as not speaking English well. Aboriginal and Torres Strait Islander Status is also coded as a dichotomous variable. Finally, the city/regional/remote dwelling variable is created by collapsing the many levels of those categories within the remoteness areas for each state (within the geographical areas – usual residence).

Socio-economic variables

As with the demographic variables, I align the Census variables dealing with socio-economic status as closely as possible with their counterparts in the HILDA data. The socio-economic variables examined within the Census data are: income, employment status, and educational attainment.

Income is provided in the Census table builder as weekly personal income, which is closest to the weekly wage variable of HILDA. Census does not

provide it as a continuous variable so I leave the categories as provided, rather than attempting to collapse them into income quintiles.

Employment status is measured by the 'Labour force status' variable with employed full time, employed part-time, unemployed and not in the labour force as the categories of interest. Responses where hours worked or labour force status are not stated are excluded.

Educational attainment is assessed by combining responses from two variables; 'Highest year of school completed' and 'Non-school qualification: level of education'. Once again, some categories are collapsed to match the HILDA response groups as closely as possible. The collapsing of categories here does create an issue as those who have completed Year 12 and gone on to further educational achievements are double counted. This is taken into consideration when interpreting the analysis of this variable.

Limitations of Census data

There are three key limitations of the 2011 Census data. These are lack of longitudinal data access, lack of individual-level data access and lack of information about physical and mental health and well-being. In spite of these limitations, Census data is the only Australian data source which aims to provide information on all Australians and for this reason alone it is worth examining. Its limitations do still need to be acknowledged, because they explain why Census data has not been used as extensively as HILDA data in this research.

Lack of longitudinal access

In stating the lack of longitudinal data as a limitation of Census data, it must be clarified that the ABS does now provide access to a longitudinal Census data set. The Australian Census Longitudinal Dataset (ACLD) provides a five per cent random sample from the 2006 Census with individual respondents

linked to their 2011 Census responses (de-identified). Although the ACLD will be a valuable tool for many Australian researchers, a longitudinal data set with only two time points is unsuitable for both of the key longitudinal analytical techniques used in this thesis. Generally speaking, longitudinal data with only two time points prohibits many forms of analysis, particularly those interested in dynamics. Due to its many waves of collection, HILDA data provides greater opportunity for longitudinal analysis in this thesis.

Lack of individual-level data

Once again, this limitation comes with a caveat. The ABS does indeed provide both a one per cent and a five per cent sample unit record file of the 2011 Census data. These Confidentialised Unit Record Files (CURFs) do provide access to an individual level data set that would allow for more complex analysis. This data was not accessed for this research due to the associated cost and the fact that it is cross-sectional (not longitudinal).

Lack of information regarding physical and mental health and well-being

Given that the Census aims to reach all Australians, it is a key aim of the ABS that completion of the Census is not an overly burdensome process. As such, the Census minimizes the amount of questions asked as much as possible. Outside of Australians about their need for assistance, questions about health and well-being (both mental and physical) are not included in the 2011 Census. Given that the literature review demonstrates a link between the provision of care and poor physical and mental health, HILDA data are the more appropriate data set for in-depth analysis. Although each individual limitation of the Census data could be addressed in isolation, considering the lack of longitudinal data access, individual-level data and information about health and well-being together, Census data are not appropriate for use as the primary data source for this research.

In summary, both HILDA and Census data have their own unique strengths and limitations. Having outlined the two data sources analysed in the research of this thesis, the analytical approaches and techniques used are now presented.

Methods

The two data sources outlined above indicate clearly that the methods employed in this thesis are quantitative and longitudinal. In addition to being quantitative or longitudinal approaches in a general sense, this thesis uses the specific analytical techniques of event-history analysis and multilevel modelling. The following section of the data chapter begins by presenting the strengths and limitations of quantitative and longitudinal analyses at a general level. The specific techniques of event-history analysis and multilevel modelling are then defined and a rationale for their inclusion is provided. The in-depth explanation of each specific approach (including equations etc.) are reserved for discussion in the corresponding results chapters.

Quantitative analysis

Quantitative analysis is often defined in reference to its difference to qualitative analysis (Vaus 2002b, Nueman 2006). The key difference between quantitative and qualitative research is that a qualitative approach is often used as an exploratory tool to investigate issues at the individual level, whereas quantitative approaches allow the researcher to make more general assumptions and explanations about the behaviour of a population (Vaus 2002b, Nueman 2006). Both quantitative and qualitative approaches are valuable research tools with their own strengths and weaknesses. My key aim is to answer my research questions in a way that is generalizable to the rest of the Australian population. Additionally, the existing literature regarding the provision of informal care and child care in Australia provides an adequate starting point to begin identifying the predictors and impacts of dual care.

Therefore, quantitative analysis of existing data sets are leveraged to understand the experiences of dual carers in Australia, in a way that can be extrapolated to the entire Australian population.

In terms of the specific types of quantitative analysis to be found in this thesis, I employ two key longitudinal analytical techniques (detailed in the following section). In addition to those primary analytical techniques I have also used a number of simpler quantitative techniques. These include univariate analysis such as frequency distributions, and bivariate analysis including cross-tabulations. The purpose of these quantitative analyses is to establish correlations or relationships between different caring responsibilities and other variables. The following section outlines why longitudinal analysis is needed to answer questions about the predictors and impacts of different caring responsibilities in a more meaningful way.

Longitudinal analysis

Most surveys are cross-sectional, which means they examine a sample of the population at one point in time. Analysis performed on cross-sectional data are only able to give a 'snapshot' of information about the surveyed population at that time (Rose 2000a). Longitudinal surveys, on the other hand, take a number of repeated measures of the same group of individuals over a period of time; this leaves longitudinal analysis with the unique benefit of being able to examine transitions between states (Rose 2000a). The ability to investigate transitions between states is the key strength of longitudinal analysis and the reason why it is used in this thesis. This research aims to identify the predictors and impacts of different caring behaviours (dual care in particular). Movement in and out of the various caring responsibilities is a 'transition between states', the observation of which allows us to begin answering the questions of what characteristics make people more likely to take on different caring responsibilities and what the impacts of changes to caring responsibilities are. These answers are only obtainable through

longitudinal analysis, which is why it features so strongly throughout this thesis.

The key strength of longitudinal analysis has been outlined above. Along with its enhanced investigative power, longitudinal analysis also brings with it some unique limitations. The two key limitations are attrition and the issue of order of events between time points. Both of these limitations are outlined in the discussion of the HILDA data set. To review those concerns: attrition occurs when respondents 'drop out' of a survey, or do not participate in every wave. Attrition can pose a serious issue for the validity of analysis because the attrition may be non-random (ie. some characteristics make people more like to leave the survey), resulting in a biased sample (Winkels and Withers 2000). The issue of order of events between time points is also described as the issue of time-varying variables (Singer and Willett 2003, Allison 2010). This issue occurs when events happen in between data collection points and the researcher is unable to ascertain the true order in which they occurred. Both limitations were discussed more fully in the HILDA section of this chapter, where it was argued that these limitations are not serious enough to discount the key benefit of longitudinal analysis.

Having made the decision to utilise longitudinal analysis, I then decided on two specific longitudinal analytical techniques; event-history analysis and multilevel modelling. These techniques are now introduced, although the in-depth explanation of how they work is reserved for discussion in the corresponding results chapters.

Event-history analysis

Event-history analysis, also known as survival analysis, is used for answering questions about *whether* or *when* events occur (Singer and Willett 2003). It is appropriate for this thesis because the first key research question asks what the predictors of dual care are. In other words, this research seeks to discover

whether or not Australians become dual carers, given their other characteristics. As well asking whether Australians become dual carers (based on other characteristics) this research also predicts two other caring responsibilities (informal care and child care) and investigates how their predictors differ from the predictors of dual care. In order to understand how dual care differs from other caring responsibilities, event-history analysis is first run with dual caring as the event of interest. Essentially, the event of becoming a dual carer is the dependent variable and other demographic and socio-economic characteristics form the independent variables, predicting the likelihood of dual caring occurring. Following the dual care model, further models are run with informal care and child care (separately) as the dependent variables. This allows an exploration of how different independent variables can predict different types of care. For example, gender may be a strong predictor of child care and dual care, but only a weak predictor of informal care.

The details of the methodology of event-history analysis are presented alongside their results in Chapter Six – The Predictors of Dual Care.

Multilevel modelling

Many researchers utilise multilevel model analysis to explore the differences *within* groups and differences *between* groups (Rabe-Hesketh and Skrondal 2012). When considered in a longitudinal setting, multilevel modelling offers a unique way to understand change in a data set. It allows us to examine within-individual change and inter-individual differences in change (Singer and Willett 2003). In longitudinal analysis, *individual respondents* form the higher-level groups and the *repeated measurements over time* for each respondent form the lower level of the multilevel model.

Multilevel modelling is used in this thesis to explore change *within* four caring groups; dual carers, informal carers, child carers and non-carers (the reference group). It is also used to explore change *between* those four groups. By

analysing the change within and between dual carers, informal carers, child carers and the non-caring population across a range of variables, this analysis reveals the impacts of dual caring and shows how they are different to the impacts of informal caring, child caring and having no caring responsibilities. In this way, multilevel modelling facilitates answering of the second key research question, which asks; what are the impacts of dual caring, and how are they different from the impacts of providing informal care, child care or not having any caring responsibilities?

For each variable on which the impacts of caring were being investigated, a number of models were run. Multilevel models allow for changes in elevation and slope, changes in elevation but not slope, and changes in slope but not elevation. A model which allows for a change in both elevation and slope allows the impact of caring status to have an immediate effect, as well as allowing that effect to intensify or diminish over time. Models allowing for changes in elevation only allow the impact of caring to change immediately and those allowing for changes in slope only do not allow for an initial impact, but do allow for an impact which changes over time. In other words, multilevel models allow us to investigate how events or characteristics of individuals impact on those individuals, both when they happen and over time. The details of this methodological approach are presented in Chapter Seven – The Impacts of Dual Care.

Conclusion

The primary purposes of this data chapter were; to outline the specific data sets analysed in the research, to demonstrate the ways in which key variables have been defined, constructed or modified for analysis, and to introduce the specific analytical techniques used.

HILDA and Census data were introduced and the rationale for using each data set was provided. The key strengths of HILDA include being nationally

representative; meaning the analysis is generalizable to the wider Australian population, and being longitudinal; which allows for analysis addressing causation (or at a minimum order of events) rather than simply correlation. The primary strengths of the Australian Census data are that it is a complete survey of the Australian population, and that the questions regarding provision of care are very straightforward and unlikely to exclude any kinds of carers.

The limitations of each data set were also outlined. HILDA data faces limitations in the form of attrition, the measurement of the provision of care and identifying the order of events occurring between time points. Census data is limited in the lack of longitudinal data access, lack of individual-level data access and a lack of information regarding physical and mental health and well-being. Considered together, the outlined strengths and weaknesses of each data set shape decisions about the ways in which each source is used.

In addition to providing information about the data used in this thesis, the data chapter also introduced the specific analytical approaches and techniques employed. This included an examination of quantitative and longitudinal approaches at a more general level, and then a more specific exploration of event-history analysis and multilevel modelling. It was demonstrated that event-history analysis allows researchers to answer questions about how certain variables can predict event occurrence. Event-history analysis therefore facilitates answering of the research question regarding what characteristics predict each type of caring responsibility (informal care, child care or dual care). Multilevel modelling was shown to be useful in measuring the impacts of characteristics or events over time. Therefore, multilevel modelling is used to investigate the ways in which different caring responsibilities impact a wide variety of other areas.

The presentation of results obtained through use of the aforementioned data sets and analytical techniques begins in the following chapter, Chapter Five – Illustrating Dual Care in Australia.

Chapter Five - Illustrating Dual Care in Australia

Introduction

The reviewed literature of Chapters Two and Three illuminates the gap in the literature regarding dual care in Australia. This chapter addresses that gap in knowledge by illustrating the characteristics of dual carers in Australia. In addition to presenting the characteristics of dual carers, this chapter also explores the characteristics of informal carers, child carers and those with no caring responsibilities. In doing so, the findings presented here confirm much of what was surmised from the existing literature, but also challenge some of the expectations raised. Essentially, this chapter sets the scene for the more complex analyses of later chapters, establishing relationships between caring responsibilities and other variables without making claims about the direction of influence.

The chapter begins with an exploration in changes in caring over time using HILDA data. This analysis demonstrates that the proportions of all types of caring responsibilities have remained fairly steady over the years 2005 to 2013. Investigating caring over time also allows for an examination of 'spells' of caring; whether dual carers stay constant in providing care or if they move in and out of their caring responsibilities over the course of the survey.

The final use of longitudinal HILDA data in this chapter is an examination of the ways in which Australians 'enter' dual caring. Dual carers can move into their dual responsibilities in three ways; from informal caring (by picking up a child care responsibility), from child caring (by picking up an informal caring responsibility) or from non-caring (picking up both a child care and an informal care responsibility at the same time). Analysis of the HILDA data

demonstrates that entry from child caring (by acquiring an informal caring responsibility) is by far the most common entry method.

In addition to the changes over time, HILDA data is also used in this chapter to provide a 'snapshot' of the characteristics of different caring responsibilities at a single point in time. Specifically, the snapshot analysis explores the demographic, socio-economic and health and wellbeing characteristics of Australians with differing caring responsibilities. This is achieved through examination of the most recent wave of HILDA data, from 2013. The cross-sectional analysis of the HILDA data supports many of the assumptions borne out of the literature review. Specifically, the analysis suggests that all the types of carers (dual, informal and child) are more frequently female, in a relationship, unemployed or employed part time, and with lower levels of life satisfaction and health and wellbeing.

Following the snapshot analysis of the HILDA data, Australian Census data from 2011 is examined. As there is only the one time point for the Census data, there is no analysis of change over time using Census. Rather, analysis of the Census data repeats the snapshot analysis described above. This analysis is important as it provides an insight into dual care when it includes grandparent care (which is generally excluded due to the operational definitions used in HILDA). This inclusion shows us that some aspects of dual care are different when a more inclusive definition is used. As per the snapshot analysis of HILDA, the Census analysis focuses on the demographic, socio-economic characteristics of different caring responsibilities, but is not able to provide information on health or wellbeing.

Who cares? Answers from HILDA

Proportions of caring responsibilities

The obvious starting point for analysis of dual care in Australia is finding out exactly how many Australians provide dual care (and other types of care). Table 5.1 presents the total numbers and weighted proportions of Australians with different types of caring responsibilities in 2013.

Table 5.1 Caring status, number and weighted percentage, 2013

	Weighted percentage	Total number
No caring responsibilities	70	12,187
Informal caring responsibility only	5.9	941
Child care responsibility only	22.5	4,068
Dual caring responsibility	1.6	277
Total	100	17,473

Source: HILDA, 2013

The above table shows that 12,187 HILDA respondents report providing neither informal care nor child care in 2013. This suggests that the vast majority of Australians, around 70 per cent, have no caring responsibilities. Informal caring responsibilities are reported by 941 respondents, which corresponds to approximately 5.9 per cent of Australians providing informal care only. Considered in conjunction with dual caring responsibilities, HILDA data suggests that approximately 7.5 per cent of Australians occupy an informal caring role. This finding is conservative in comparison to the previously reported rates of informal care in Australia presented in the literature review. Specifically, the findings of the 2012 SDAC indicated rates of informal care in Australia are closer to 12 per cent (Australian Bureau of Statistics 2013d). The fact that HILDA demonstrates lower levels of informal care is not surprising given the many previously discussed factors which can

reduce self-identification or participation in surveys of carers. It is therefore important to keep in mind that this research may under-represent informal care (and, by extension, dual care) in Australia.

Table 5.1 demonstrates that HILDA data indicates just under one quarter of Australians have child care responsibilities. This proportion appears to be more in line with what was established in the literature review, where Census data from 2011 indicated that just over one quarter of Australians provided child care (Australian Bureau of Statistics 2011b).

Finally, Table 5.1 reports approximately 1.6 per cent of Australian have dual care responsibilities. Given that the provision of dual care has not been adequately addressed in previous research, it is difficult to compare it to rates found in the literature review. However, the Families Caring for a Person with Disability Study (FCPDS) found approximately 31.9 per cent of the primary carers in their study (nearly one in three) cared for at least one child in addition to caring for a person with a disability (Edwards, Higgins et al. 2008). This figure is similar to the proportion of dual carers (of informal carers) shown in Table 5.1, where the number of dual carers is roughly 30 per cent of the number of informal carers. Overall the proportions of different types of caring responsibilities show what we would expect; the majority of Australians have no caring responsibilities, followed by those with child caring responsibilities only, then significantly fewer with just informal care responsibilities and a small proportion occupying dual care roles.

Change in caring over time

HILDA is a longitudinal data set, which means we can investigate the number and proportions of different types of caring responsibilities over time. Table 5.2 illustrates those figures from 2005 to 2013. These percentages are not weighted which accounts for the slight differences in the percentages seen for 2013 in Table 5.1

Table 5.2 Caring status, number and percentage, 2005 – 2013

	No caring responsibilities	Informal caring responsibility	Child care responsibility	Dual caring responsibility
2005	8667 (68.0)	681 (5.3)	3171 (24.9)	227 (1.8)
2006	8799 (68.3)	725 (5.6)	3127 (24.3)	236 (1.8)
2007	8826 (69.1)	614 (4.8)	3127 (24.5)	208 (1.6)
2008	8839 (69.2)	687 (5.4)	3041 (23.8)	206 (1.6)
2009	9267 (69.7)	682 (5.1)	3137 (23.6)	202 (1.5)
2010	9509 (70.4)	653 (4.8)	3139 (23.2)	206 (1.5)
2011	12179 (69.2)	941 (5.3)	4193 (23.8)	280 (1.6)
2012	12044 (69.0)	989 (5.7)	4123 (23.6)	291 (1.7)
2013	12187 (69.7)	941 (5.4)	4068 (23.3)	277 (1.86)

Source: HILDA, 2005-13

For each caring responsibility, the first number is the raw number of HILDA respondents reporting that kind of responsibility in the given year. The second, bracketed number is the corresponding percentage of respondents. Inspection of the numbers over time shows a significant increase for all groups between 2010 and 2011. This is not reflective of actual population growth, rather it is the result of the inclusion of the 'top-up sample' described in the data chapter. Looking at the percentages gives a clearer indication of the proportions of different caring responsibilities in relation to each other, and removes the effect of the top up sample. Although there are some small fluctuations in the percentages of each type of caring responsibility, overall there is little change illustrated over time. Rates of informal care, child care and dual care all appear to have been relatively stable over the time period examined.

Entry to dual care

Before I began exploratory analysis of the HILDA data, my research questions included an additional angle; did the impacts and predictors of dual care differ depending on how people become dual carers? These 'entries to dual care' refer to the individual's caring responsibilities immediately prior to

becoming dual carers. There are three distinct pathways in which Australians enter dual care. The first type of entry into dual caring occurs when the respondent already has a child care responsibility, then someone else in their lives requires informal care so the respondent assumes the informal caring responsibility in addition to the existing child care responsibility. The second entry to dual care occurs when someone with an existing informal caring responsibility assumes a child care responsibility. The third and final entry to dual caring occurs when a respondent with no caring responsibilities assumes both an informal caring responsibility and child care responsibilities at the same time (the 'same time' here means over the course of one year, because the HILDA survey is conducted annually).

Given that people are more likely to have a child care responsibility, my expectation of entry to dual care is that majority of dual carers would enter from a state of having a child care responsibility. I expect fewer to enter from informal care and fewer again to enter from no care responsibilities. In fact, almost all entries to dual care are from child care: 94 per cent of dual care entries occur to respondents that have an existing child care responsibility and then assume an informal care responsibility. Of the remaining six per cent, three per cent of entries are from informal care, and three per cent are from no caring responsibilities.

Because there are so few cases of entry to dual caring from states other than child caring, I am not able to perform further analyses using entry to dual caring as a predictive or outcome variable. Although this lack of variation limits options for further analysis, it is nonetheless a very interesting finding. It raises the question of why this is the dominant pathway. I propose two possible explanations: firstly, it could be related to the 'burden of care' explored previously. Informal carers may feel more burnt out or stressed and are therefore reluctant to take on additional responsibilities, whereas those with only child care responsibilities are not experiencing the same strain,

therefore feeling able to provide additional informal care should the need arise.

The second explanation is that the operational definition of child care and dual care has shaped the patterns of entry to dual care. As outlined in the data chapter, child carers are defined primarily as parents living with their children. Because of a lack of relevant questions in the HILDA survey, grand-parenting and other unpaid child care are not included in either the child care or dual care variable. This means that the age structure of dual carers is likely younger than it would be if grand-parents are included. Had the data been available, older dual carers, possibly providing informal care to a spouse and child care to a grandchild would likely have significantly pushed up the number of dual carers entering dual care as informal carers first.

Spells of dual care

As well as describing the way that Australians enter dual care, longitudinal data also allows us to answer questions about movement in and out of dual caring roles over time. This movement in and out of a state, and time spent within a state is sometimes referred to as a 'spell' (Rose 2000b). For example, someone who provides dual care continuously for three years in a row would be defined as experiencing one 'spell' of dual care, whereas someone who provided dual care for one year, had a break, then provided dual care again for one year would be defined as experiencing two spells of dual caring. Table 5.3 presents the number of dual caring 'spells' experienced by dual carers in the HILDA data.

Table 5.3 Dual caring spells, 2005 – 2013

	Number of respondents	Percent
One spell	1,513	84
Two spells	262	14.5
Three spells	28	1.6
Four spells	3	0.2
Total	1,806	100

Source: HILDA, 2005-2013

It is evident that the vast majority of respondents (84 per cent) experienced only one spell of dual care during their time in the HILDA survey. A much smaller, but still significant proportion reported two spells of dual care (14.5 per cent) and very few respondents appeared to experience more than three spells of dual care. These findings show that there is little movement in and out of dual caring responsibilities.

Characteristics of dual carers

The following section of this chapter explores the characteristics exhibited by respondents in HILDA with different caring responsibilities. These characteristics are divided into three segments; demographic characteristics, socio-economic characteristics and health and wellbeing indicators. The discussion begins with demographic characteristics.

Demographic characteristics

The demographic characteristics of different caring responsibilities examined here are; sex, age, relationship status, country of birth, English proficiency, type of area lived in (city, regional or remote), and Aboriginal or Torres Strait Islander status. These demographic characteristics are aggregated below in Table 5.4. Each individual variable is discussed separately following the presentation of Table 5.4.

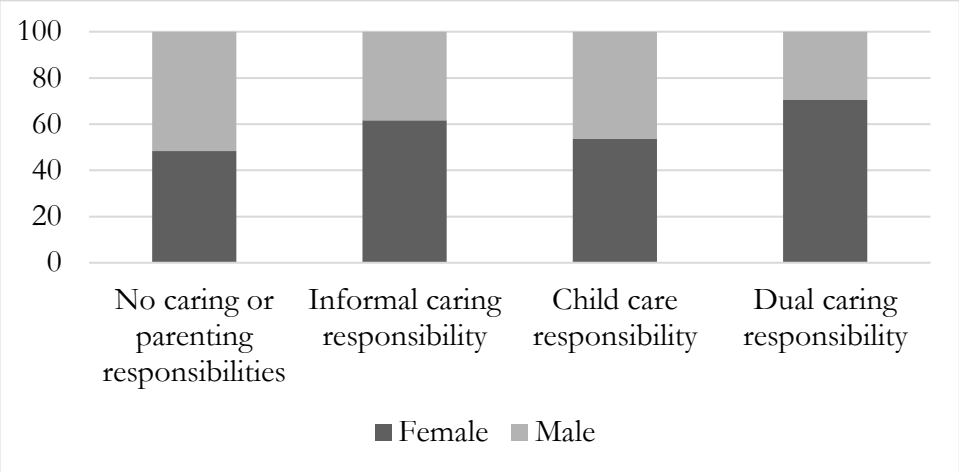
Table 5.4 Demographic characteristics of different caring responsibilities, percentages, 2013

	No caring responsibilities	Informal caring responsibility	Child care responsibility	Dual caring responsibility
Sex				
Female	48.3	61.6	53.7	70.7
Male	51.7	38.4	46.3	29.3
Relationship status				
Not living with a partner	52.3	40.3	13.2	21.3
Living with a partner	47.7	59.7	86.8	78.7
Sex / relationship status				
Single Men	28.0	15.0	2.0	1.5
Partnered Men	24.0	24.0	44.0	28.0
Single Women	25.0	25.0	11.0	20.0
Partnered Women	23.0	36.0	43.0	51.0
Age group				
15-24	22.9	7.7	2.9	1.4
25-34	16	6.4	27.4	16.5
35-44	8.3	5	46.4	50.7
45-54	14.5	22	20.1	27.1
55-64	16.9	29	2.9	3.9
65-74	12.4	17.4	0.4	0.5
75-84	6.8	9.2	0	0
85+	2.4	3.3	0	0
Country of birth				
Born in Australia	78.3	74.8	78.2	80.9
Not born in Australia	21.7	25.2	21.8	19.1
English proficiency				
Speaks English well	98.5	98.2	98.9	97.8
Does not speak English well	1.5	1.8	1.1	2.2
Area lived in				
City area	63.4	57.3	63.5	57.0
Regional area	34.8	41.1	35.3	41.2
Remote area	1.8	1.6	1.2	1.8

Source: HILDA, 2013

The first demographic characteristic to be explored in detail is sex. Figure 5.1 shows the gendered breakdown of HILDA respondents by their caring responsibilities.

Figure 5.1 Sex composition of caring responsibilities, percentage, 2013

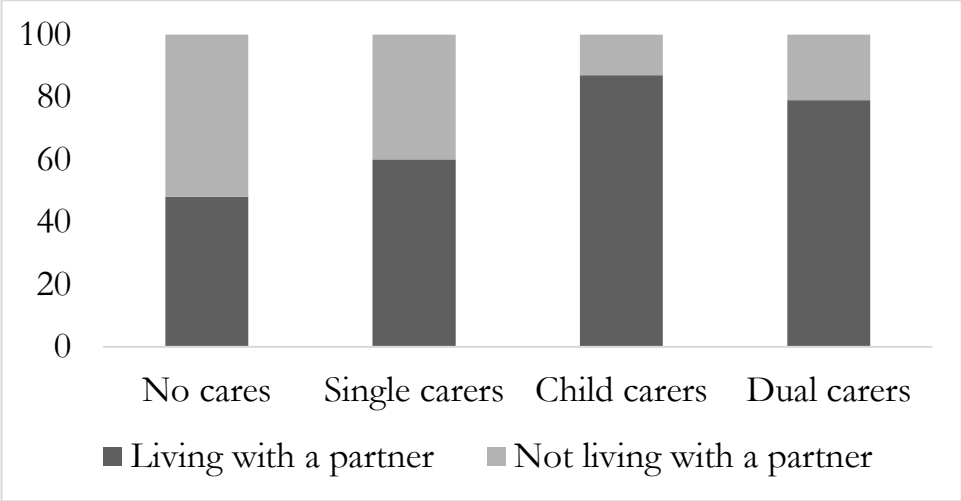


Source: HILDA, 2013

For those with no caring responsibilities, there is a fairly even spread of men and women (51.7 and 48.3 per cent respectively). Just over 60 per cent of those with an informal caring responsibility are women, and 53.7 per cent of those with child caring responsibilities are women. Dual carers exhibit the largest gender imbalance; 70.7 per cent of dual carers are female, and just 29.3 per cent male.

Relationship status is broken down by caring responsibilities in Figure 5.2. This figure illustrates that relationship status varies considerably between those with different caring roles. People with no caring responsibilities had the lowest percentage living with a partner, with only 47.7 per cent. Those with an informal caring responsibility only were more likely to be living with a partner, with 59.7 per cent of those respondents doing so. Child carers actually reported the highest share of living with partners at 86.8 per cent and dual carers showed the second highest with 78.9 per cent living with a partner.

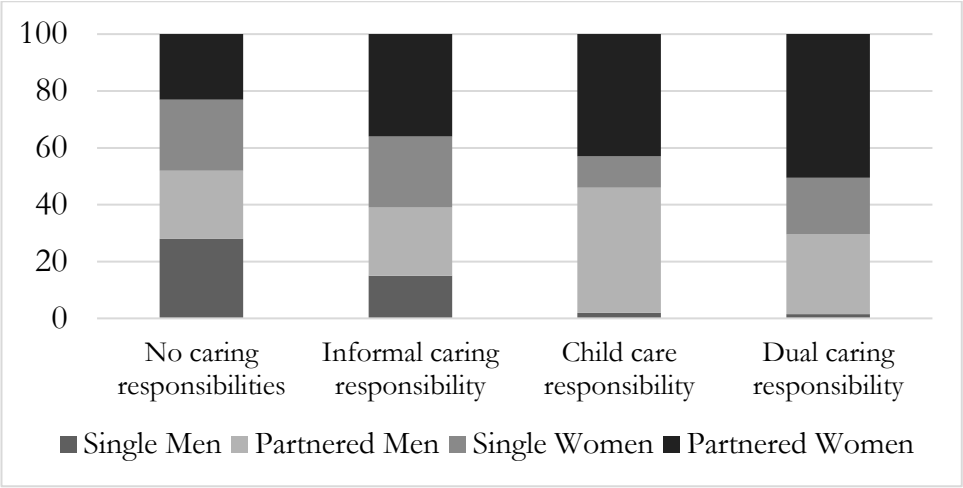
Figure 5.2 Relationship status composition of caring responsibilities, 2013



Source: HILDA, 2013

As well as examining sex and relationship status by caring roles separately, it is also useful to look at the breakdown of sex and relationship status together. Figure 5.3 presents this breakdown by organising respondents into four groups; single men, partnered men, single women and partnered women. The composition of each caring responsibility of those groups shows some interesting results.

Figure 5.3 Sex and relationship status by caring responsibility, 2013

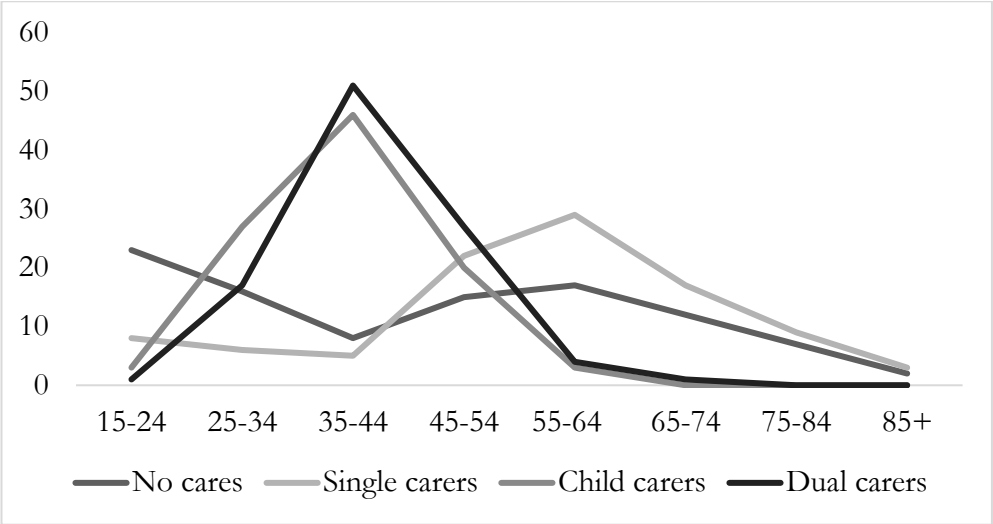


Source: HILDA, 2013

Those with no caring responsibilities had by far the highest percentage of single men (24.9 per cent) out of all the caring groups, and a fairly even spread of the other sex/relationship combinations. All other caring responsibilities had a clear majority of partnered women. This majority of partnered women was most pronounced for dual carers, 48.7 per cent of whom were partnered women. Given the findings of the literature review that being female and being partnered were associated with both providing informal care and child care, it is not surprising that dual carers demonstrate an even greater majority of partnered women. These findings suggest those gendered theories of the provision of care still hold up for informal care and child care, and are especially applicable to the provision of dual care.

The age distribution of the different caring roles is exhibited in Figure 5.4. With age in ten-year age groups, this figure illustrates that dual carers have a very different age structure than informal carers and those with no caring responsibilities.

Figure 5.4 Age composition of caring responsibilities, 2013



Source: HILDA, 2013

Interestingly, the age structure of dual carers and child carers is quite similar, with both exhibiting a clear peak at ages 35-44, and declining sharply thereafter. Informal caring responsibilities peak at ages 55-64, whereas those with no caring responsibilities exhibit a much younger age distribution, peaking at ages 15-24 and at their lowest at ages 35-44. Overall, HILDA data suggests that those with no caring responsibilities are generally younger, those with informal caring responsibilities are older and that child carers and dual carers have similar age structures peaking around 35-44 years of age.

As well as examining the sex, relationship status and age of carers in Australia, HILDA allows for examination of other demographic variables such as country of birth, English proficiency and type of area lived in. These three variables do not exhibit much variation on different caring responsibilities, as a result, they have not been illustrated further than the reporting of their percentages in Table 5.4.

For country of birth, all caring groups demonstrate a similar majority of being born in Australia. One unexpected result here was that dual carers have the smallest proportion of people born overseas. Given that the literature review

indicates that being born overseas was more common in informal carers than non-carers, it was expected that dual carers would also exhibit higher rates of being born overseas than those with no caring responsibilities. Counter to this expectation, Table 5.4 indicates that dual carers actually have the lowest proportion of overseas born out of all the caring responsibilities, with 19.1 per cent being born outside of Australia. A potential explanation for this is that those who are born overseas, and are young enough to be counted as child carers, may be less likely to have close family members living in the country to whom they could provide the additional informal care to. This would mean that they would be less likely to have the opportunity to become dual carers than those who were born in Australia.

Given the pattern demonstrated in the previous table, it could be expected that dual carers will also have the smallest proportion of people with low English proficiency. Table 5.4 shows that this is not the case. Instead, dual carers actually exhibited the highest percentage of respondents who did not speak English well, at 2.2 per cent. It might have been expected that English skills would correlate strongly with being born in Australia, and this may still be the case. However, there is something else going on with the higher proportion of dual carers who do not speak English well. One possible explanation for this pattern could be that those with poorer English skills are less employable and therefore spend more time engaged in other roles, such as dual caring. As this analysis does not control for other variables it is left to the analysis of later chapters to explore this further.

Another demographic characteristic of interest is the type of area lived in. HILDA respondents are classified as living in either a city, regional or remote area. Table 5.4also illustrates the breakdown of area lived in by caring responsibility. Although on the whole there does not appear to be a lot of variation between the four caring types, there are some relevant differences. All categories show a majority living in cities, following by regional areas, with

a very small proportion living remotely. Those with informal caring responsibilities and those with dual caring responsibilities have a similarly higher proportion of people living in regional areas (both approximately 41 per cent) compared to those with no caring responsibilities or child caring responsibilities, who both have close to 35 per cent of respondents living regionally.

The final demographic characteristic explored in this section was intended to be Aboriginal and Torres Strait Islander status. Unfortunately, the number of HILDA respondents identifying as Aboriginal or Torres Strait Islander is so low that this analysis is not possible. Specifically, only one respondent who identifies as Aboriginal or Torres Strait Islander was also identified as being a dual carer. Indeed, in the 13th wave of HILDA there are only slightly over 500 respondents identifying as Aboriginal or Torres Strait Islander. This is less than 0.5 per cent of the sample. As a result, Indigenous Australian status is not a suitable variable for analysis in any analysis of HILDA data. It is, however, still included in the examination of Census data and will be explored further in a later section of this chapter.

Socio-economic characteristics

The following section examines the socio-economic characteristics possessed by HILDA respondents with different caring responsibilities. There are three variables used here to measure these characteristics. They are; employment status, disposable income (in quintiles), and educational attainment. The socio-economic characteristics of each caring responsibility are broken down by percentage and presented in Table 5.5. In addition to this table, each variable is discussed individually.

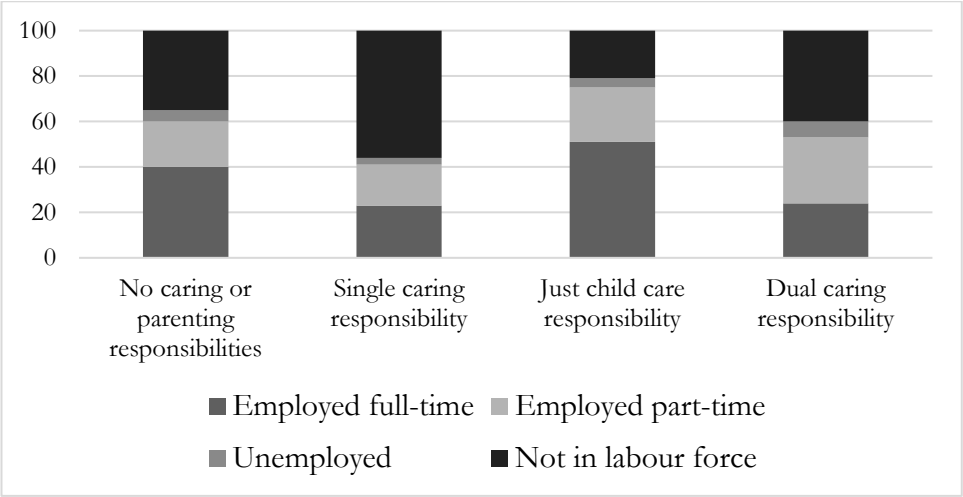
Table 5.5 Socio-economic characteristics of different caring responsibilities, percentages, 2013

	No caring responsibilities	Informal caring responsibility	Child care responsibility	Dual caring responsibility
Employment Status				
Employed full-time	40.0	23.2	51.1	24.4
Employed part-time	20.1	17.6	24.2	29.1
Unemployed	4.6	2.9	3.7	6.9
Out of the labour force	35.4	56.4	21.0	39.6
Income				
First	18.9	15.5	11.0	12.6
Second	21.1	32.9	11.3	16.6
Third	18.6	19.9	17.9	27.1
Fourth	19.1	13.7	22.5	24.6
Fifth	22.3	18.0	37.4	19.1
Educational attainment				
Did not finish Year 12	32.7	37.8	18.0	29.2
Finished Year 12	16.6	11.9	13.6	13.4
Certificate or Diploma	20.7	21.2	25.1	28.9
Bachelor's degree or higher	30.0	29.2	43.4	28.5

Source: HILDA, 2013

The first socio-economic characteristics to be examined is employment status. Figure 5.5 shows the employment status breakdown of each caring responsibility. Dual carers exhibit the highest shares of all caring statuses for being unemployed or employed part time. Child carers have the largest percentage employed full time (51.1 per cent), while informal carers show the biggest group of those out of the labour force (56.4 per cent).

Figure 5.5 Employment status by responsibility, percentages, 2013

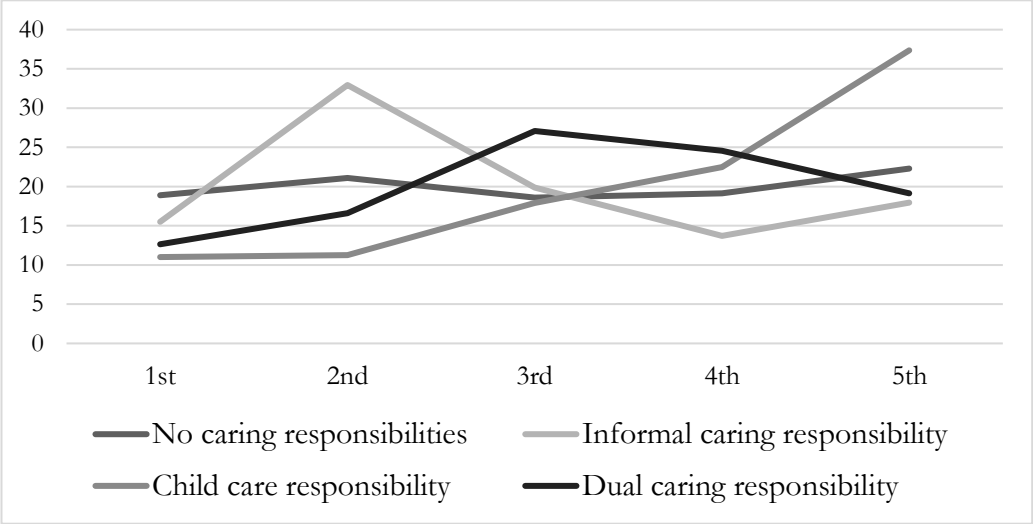


Source: HILDA, 2013

Looking more closely at the employment of dual carers, Figure 5.5 shows they have the largest percentage of unemployed people, with seven per cent being unemployed, and the second largest proportion out of the labour force at 39.6 per cent (behind informal carers). They also have the largest proportion working part time, approximately 29.1 per cent, and the second smallest proportion working full time (again second to informal carers). These findings clearly indicate that dual care is associated with lowered levels of employment. The direction of causality of this correlation is further explored in later chapters.

Disposable income was divided into quintiles for Figure 5.6, with one being the lowest income quintile and five being the highest. Interestingly, child carers reported the largest proportion of the top income quintile, while dual carers reported the largest proportions of the third and fourth income quintiles. Those with no caring responsibilities demonstrate a fairly even spread across the income quintiles. The other interesting feature of this figure is the peak of informal carers in the 2nd income quintile, indicating they demonstrate lower levels of income than the other caring responsibilities.

Figure 5.6 Distribution of disposable income (quintile) by caring responsibility, percentage, 2013

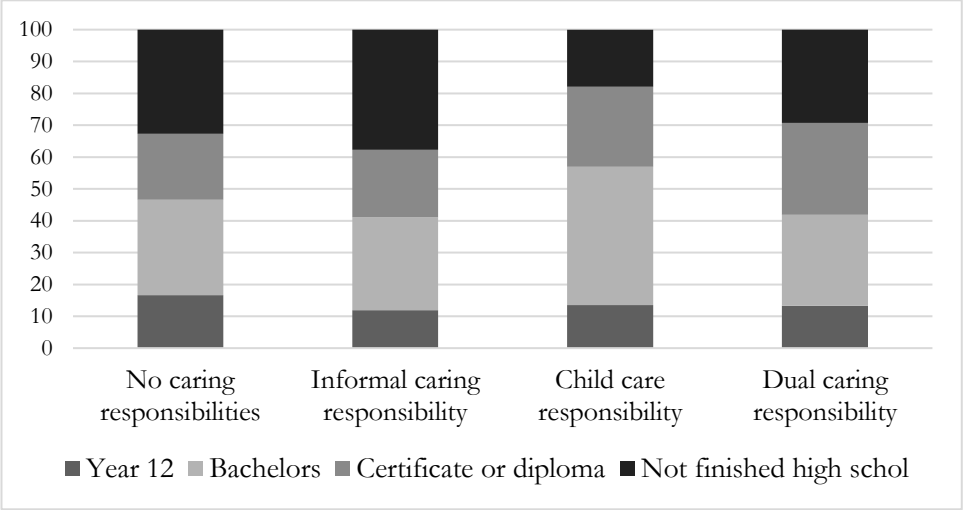


Source: HILDA, 2013

Given the complicated relationships between age, sex and income there is likely a lot going on behind the scenes in this figure. As it does not control for any other variables, we must look to the more complex analyses of Chapters Six and Seven to fully understand the relationship between income and carer status. It is possible that when other variables are controlled for, the income distribution of dual carers could look quite different.

The final socio-economic characteristic to be presented is education. Figure 5.7 illustrates the spread of the highest educational achievements of each caring group.

Figure 5.7 Highest education level attained by caring responsibility, percentages, 2013



Source: HILDA, 2013

On first inspection, all of the caring groups seem to have a fairly similar spread of educational achievement, with the exception of child carers, who exhibit a much higher proportion of people with a Bachelor's degree or higher (and correspondingly smaller proportion of those who have not finished Year 12). This runs somewhat counter to what expected from the literature review – namely that those who have invested heavily in their own education would be less likely to take up caring responsibilities due to the high opportunity cost. However, this may still be the case. As has been said numerous times so far, these analyses do not control for other variables. It seems likely that sex and age in particular would have a confounding effect on the relationship between education and caring. These effects are further explored in chapter six.

Health and wellbeing indicators

The health and wellbeing indicators examined in this chapter are divided into two groups; questions about life satisfaction and questions about general health and wellbeing. The snapshot analysis of these two series of questions is slightly different from what has been presented thus far. Instead of presenting

the results of cross-tabulations in figures, this section compares the average scores recorded for each caring group, for each question. This begins with the presentation of life satisfaction scores.

HILDA respondents are asked nine separate questions about their satisfaction with various areas of their lives. The average score reported by each type of caring responsibility is shown in Table 5.6

Table 5.6 Average life satisfaction scores by caring responsibilities, 2013

	No caring responsibilities	Informal caring responsibility	Child care responsibility	Dual caring responsibility
Overall life satisfaction	7.96	7.77	7.82	7.67
Satisfaction with employment opportunities	7.14	6.91	6.99	6.79
Satisfaction with financial situation	6.79	6.59	6.38	5.95
Satisfaction with free time	7.17	6.79	5.71	5.36
Satisfaction with the home lived in	8.11	8.05	7.53	7.36
Satisfaction with feeling part of your local community	6.69	6.91	6.69	6.80
Satisfaction with the neighbourhood lived in	7.81	7.82	7.70	7.62
Satisfaction with how safe you feel	8.33	8.20	8.18	7.90
Satisfaction with your health	7.26	6.84	7.28	6.82

Source: HILDA, 2013

The average life satisfaction scores demonstrate a very clear pattern; in every category (bar one) dual carers, on average, report the lowest satisfaction of all the caring responsibilities. This finding is explored in more detail in further analysis, but it certainly appears to lend support to the idea of role overload being a serious issue for dual carers.

In addition to self-reported life satisfaction, HILDA respondents are asked a serious of questions about their health and wellbeing. The average scores for

each question and each type of caring responsibility are presented in Table 5.7.

Table 5.7 Average health and wellbeing scores by caring responsibility, 2013

	No caring responsibilities	Informal caring responsibility	Child care responsibility	Dual caring responsibility
General health	67.8	62.3	71.8	64.5
Bodily pain	72.7	64.8	77.1	69.0
Emotional wellbeing	92.1	90.1	93.9	88.5
Social functioning	83.1	76.5	86.4	76.8
Mental health	74.5	72.6	74.5	67.9
Physical functioning	82.2	74.0	89.6	84.4
Vitality	61.0	57.4	59.2	53.3

Source: HILDA, 2013

When interpreting the results of this table it is important to remember that the health and wellbeing questions are asked as part of the self-completion questionnaire (SCQ). As was outlined in the data chapter, completion rates are lower for the SCQ which may impact the results (especially if respondents who are under significant stress do not complete the SCQ as often as those who are not under stress). Theoretically, dual carers who are experiencing serious role-overload may not have enough time to complete the SCQ, leaving their average responses appearing higher than they are in reality. Nonetheless, the results are still worthy of examination, with this caveat in mind. Dual carers do not consistently demonstrate the lowest average scores in all areas (as they do in the life satisfaction questions). They do, however, consistently report lower scores than those with child care responsibilities. Dual carers also generally (but not for every question) report lower health and wellbeing scores than those with no caring responsibilities. Interestingly, informal carers seem

to experience slightly worse health and wellbeing than dual carers; in four categories the average is lower for informal carers, in three it is lower for dual carers. This could be due to the different age structures of the different caring responsibilities; informal carers are generally significantly older than all other groups. The differing results in reported health and wellbeing are further unpacked in later analysis, which also control for other variables, such as age. It is important here to remind the read that the operational definitions of the caring variables in the HILDA data are different to those that follow in the Census data. These differences will be discussed again in detail in the Census section.

Overall, the snapshot analysis of the HILDA data supports some of the findings and speculations of the literature review; particularly in terms of the demographic characteristics and many of the health and wellbeing indicators of carers. In the areas where findings are in contention with the expectations set by the existing research, it is still possible that the more complex analyses will lend more support. This is due in part to controlling for the confounding effects of other variables. The remaining section of this chapter now moves to analysis of Census data.

Who cares? Answers from Census

Census data from 2011 is examined in this chapter for two key reasons. Firstly, as it is a whole of population Census, issues of representativeness and attrition as less of a problem than they are for the HILDA data. Secondly, the Census data provides a much more inclusive measure for the provision of unpaid child care. This means that the variables for child care and dual care are able to include the considerable portion of the Australian population providing child care to their grandchildren. This section follows roughly the same structure as the proceeding section; beginning with overall proportions and numbers of the different types of caring responsibilities, followed by an

examination of demographic characteristics and concluding with socio-economic characteristics. Longitudinal analysis, and investigation of life satisfaction and health and wellbeing indicators are not included due to limitations of the Census data.

Proportions of caring responsibilities

The first figure presented from the 2011 Census data is the basic breakdown of the four different caring responsibilities, these are; no caring responsibilities, informal caring responsibility only, child care responsibility only and dual caring responsibility. The differences between HILDA and Census data due to the more inclusive measure for child care are clearly evident in this descriptive analysis. Table 5.8 shows the number and proportion of Australian broken down by their caring responsibilities.

Table 5.8 Caring status, number and percentage, 2011

	Percentage	Total number
No caring responsibilities	63.3	9,997,740
Informal caring responsibility	6.6	1,035,422
Child care responsibility	24.8	3,926,126
Dual caring responsibility	5.3	844,358
Total	100	15,803,646

Source: ABS, 2011 Census, TableBuilderPro.

Referring back to Table 5.1, which presents the same information using HILDA data, we can see some key differences. Firstly, the proportion of those with no caring responsibilities is smaller (by 6.7 per cent) when using Census data. There are only marginally more informal carers identified in the Census data (0.7 per cent) than are identified in HILDA. Census also identifies a larger proportion of people with child care responsibilities, with 2.3 per cent more than HILDA. Finally, Census data identifies significantly more dual carers than HILDA does. Specifically, Census finds 3.7 per cent

more dual carers than HILDA does. When looking at such small proportions (5.3 in Census and 1.6 in HILDA), that 3.7 per cent is significant. As is outlined in detail in the data chapter, the measures for child care provision and dual care provision in the HILDA data are conservative. Due to the inherent limitations in the data the measures exclude non-parents providing unpaid child care. The research presented in the literature review leads to speculation that the majority of this group would be grandparents caring for grandchildren. Table 5.7 (in comparison with Table 5.1) confirms that the differing measures do impact on how who is identified as a dual carer. The other impacts of this difference in measurement are further explored through the remainder of this chapter.

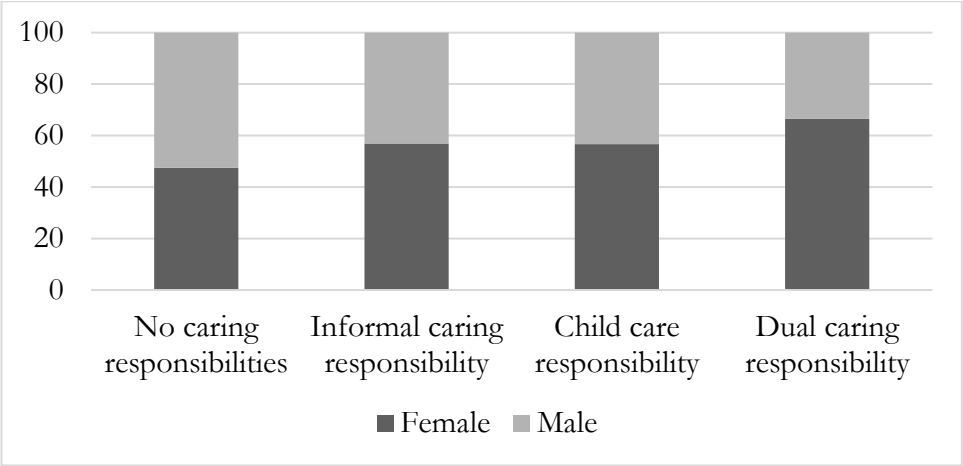
Characteristics of carers

As much as possible, the following examination of the characteristics of carers using Census data will follow the same pattern as the previous discussion of the HILDA data. This means it begins with the demographic characteristics, followed by socio-economic characteristics. Health and wellbeing indicators, which were explored previously are not examined here simply because Census does not ask those questions.

Demographic characteristics

The first demographic characteristic examined is the gendered composition of caring responsibilities. Illustrated in Figure 5.8, there is a similar pattern as was seen within the HILDA data in regards to sex and caring responsibilities.

Figure 5.8 Sex composition of caring responsibilities, percentages, 2011

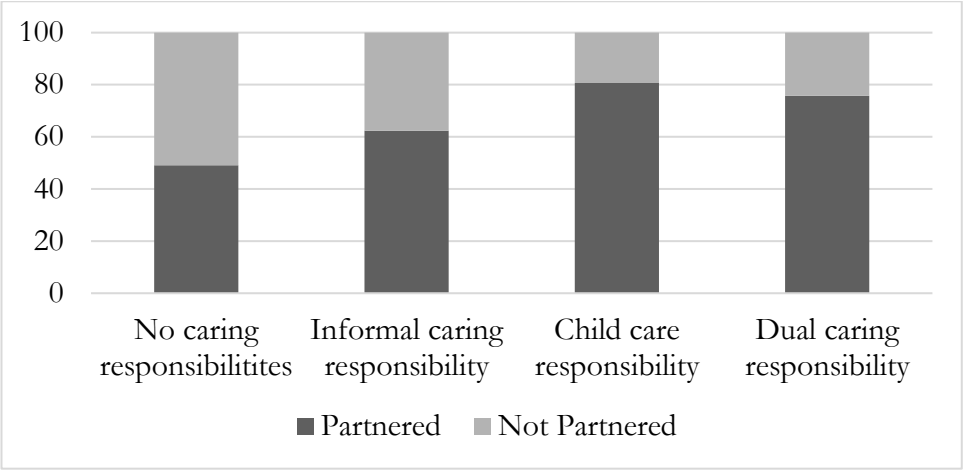


Source: ABS, 2011 Census, TableBuilderPro.

Dual carers in the Census data also exhibit the largest proportion of women (66 per cent), whereas those with no caring responsibilities are more likely to be male (53 per cent). Informal carers and child carers show similar proportions of men and women.

Figure 5.9 presents the common relationship statuses of each caring responsibility. As was found in the corresponding HILDA figure, this figure suggests that those with child care responsibilities have the largest proportion of women. Dual carers have a similar majority of women, but the proportion is not quite as large as child carers. Informal care and no caring responsibilities also show similar gendered breakdowns as was seen in HILDA.

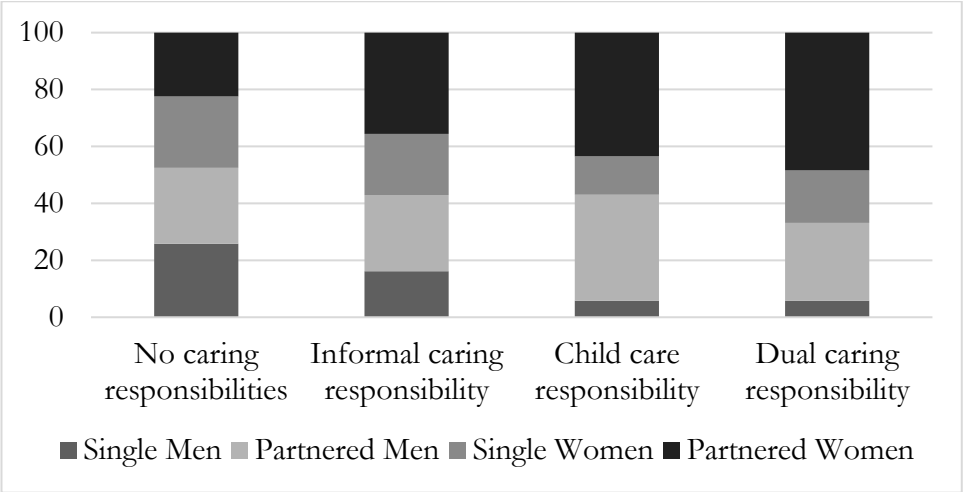
Figure 5.9 Relationship status by caring responsibility, 2011



Source: ABS, 2011 Census, TableBuilderPro.

As was the case with HILDA data, it is also useful to examine sex and relationship status together. Figure 5.10 breaks down each caring group into four categories; single men, partnered men, single women and partnered women. This figure shows similar trends to the HILDA data, with some small differences.

Figure 5.10 Sex and relationship status by caring responsibility, 2011

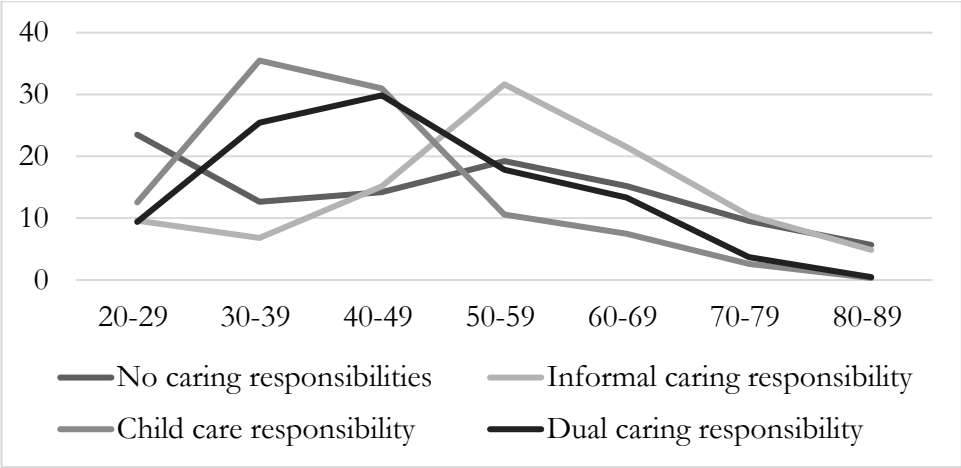


Source: ABS, 2011 Census, TableBuilderPro.

The key finding of this figure mirrors the key finding from HILDA data for sex and relationship status. Dual carers again illustrate the largest proportion of partnered women out of all four caring responsibilities. Those with no caring responsibilities exhibit the largest proportion of single men. The minor difference between the two data sets here is that both child care and dual care responsibilities show slightly higher proportions of single men than the HILDA data did. This small difference aside, the sex and relationship breakdown of caring responsibilities is near identical between HILDA and Census data.

The next demographic characteristic to be examined is the age structure of each caring type. It is within this characteristic that the implications of differing operational definitions become obvious. Figure 5.11 presents the age composition of each caring group. The age groups here are also ten-year age groups, but they are slightly different to those presented in the HILDA figure (which begins with ages 15-24). Regardless, the two figures are still comparable in terms of the overall age structure being illustrated.

Figure 5.11 Age composition of caring responsibilities, 2011



Source: ABS, 2011 Census, TableBuilderPro.

Perhaps the biggest difference between the two data sets is that the HILDA data shows much more defined peaks of caring at ages 35-44 for both dual carers and child carers. As was speculated, the more inclusive measure for child care used in Census resulted in including a larger proportion of older Australians, most likely those caring for grandchildren. This also impacted the age structure of dual carers, because providing child care is a key part of their definition. Rather than the sharp peak at ages 35-44 for dual carers, Census data show a gradual increase at its highest at ages 40-49, which then declines less steeply than in HILDA data. This slowed decline is almost certainly due to the inclusion of grandparents caring for grandchildren.

Another demographic characteristic which shows a different pattern in the Census data is country of birth. Table 5.9 presents the breakdown of country of birth for each group. There are three key differences between this table, and Table 5.4 which includes the same breakdown for HILDA data. The first difference is that there is less overall variation between the caring groups in the percentage born in Australia; all groups hover around the 70 per cent mark. For the HILDA data, the proportions range from 74 to 80 per cent Australian born. As well as demonstrating less variation, the overall shares of

Australian born are lower when in the Census table than the HILDA table. Finally, specifically for dual carers, the percentage born overseas was much lower when using the HILDA data (19.1 per cent) than it is for the Census data (27.7 per cent)

Table 5.9 Country of birth by caring responsibility, 2011

	Born in Australia	Born overseas
No caring responsibilities	68.7	31.3
Informal caring responsibility	72.8	27.2
Child care responsibility	71.1	28.9
Dual caring responsibility	72.3	27.7

Source: ABS, 2011 Census, TableBuilderPro.

As shown in the data chapter, HILDA researchers have acknowledged that under-representation of migrants is a limitation of the data. It is therefore possible that the difference between the two data sets here is the result of said sampling issue. However, it is also possible that the different caring definitions impacted the proportion of carers born out of Australia. Unfortunately, further analysis of the Census data to investigate this is not possible, due to the lack of individual level data and longitudinal data. Country of birth statistics used in later analysis (with HILDA data) are therefore used with caution.

Similar to country of birth, English proficiency looks different through Census data then it does using HILDA data. Table 5.10 illustrates the proportions of Australians who speak English well for different caring responsibilities.

Table 5.10 English proficiency by caring responsibility, 2011

	Speaks English well	Does not speak English well
No caring responsibilities	84.0	16.0
Informal caring responsibility	84.7	15.3
Child care responsibility	86.7	13.3
Dual caring responsibility	84.7	15.3

Source: ABS, 2011 Census, TableBuilderPro.

The major difference evident in Table 5.10 is that the proportion of those who do not speak English well is considerably higher for all types of caring responsibilities than what is reported with HILDA data. The other key difference is that in the HILDA data, dual carers have the highest proportion of people with poor English skills, whereas in the Census data they have the second lowest. As was the case with country of birth, sampling error is a likely culprit for this discrepancy. All people in Australia are legally required to complete the Census, and those who require help to do so are provided with help. This means that, unlike HILDA, it is difficult for those who do not speak English well to 'opt out' of participating.

Similar to HILDA, Census provides information about the type of area Australians live in. Table 5.11 illustrates the areas that people with different caring responsibilities live in. These categories have been collapsed from more detailed information into three broad area types; city, regional and remote.

Table 5.11 Area lived in by caring responsibility, 2011

	City	Regional	Remote
No caring responsibilities	71.1	26.9	2.0
Informal caring responsibility	68.4	30.0	1.5
Child care responsibility	70.1	27.6	2.3
Dual caring responsibility	69.4	28.4	2.2

Source: ABS, 2011 Census, TableBuilderPro.

In comparison to the HILDA data, Table 5.11 shows similar patterns, with all groups having a majority living in the city, followed by those living regionally and a small percentage living in remote areas. Both tables also suggest a similar breakdown for informal carers and dual carers (with both groups demonstrating a slightly higher percentage living in regional areas). Those with child care or no caring responsibilities also exhibit a similar pattern to each other, with higher shares of those living in cities. There is one difference between the Census and HILDA data on area lived in; HILDA data suggests (for all caring groups) that a larger proportion live in regional areas, at the expense of city and remote areas. This is a difference of nearly ten per cent and is constant across the caring groups. This discrepancy seems likely to be the result of over sampling of regional areas (or under sampling of city and remote areas) in HILDA and is not of particular concern for further analysis given it does not appear to overly impact any individual caring groups. However, it must still be kept in mind when interpreting the results of further analyses.

The final demographic characteristic to be explored here is Aboriginal and Torres Strait Islander status. As was explained earlier, HILDA data does not have enough respondents identifying as Aboriginal or Torres Strait Islander to include it in any analysis. Fortunately, Census data does. This means that the only glimpse that this research will be able to take into the relationship between caring responsibilities and Indigenous status is the following table. Table 5.12 presents the caring responsibilities of the Australian Aboriginal or

Torres Strait Islander population compared to those of the non-Indigenous Australian population. This table (and its corresponding values in the aggregate Table 5.4) presents the information in a different way to previous tables. Because the proportion of the Australian population who identify as Aboriginal or Torres Strait Islander is very small, these statistics are presented here to show the proportion of the Indigenous population who provide care (rather than the proportions of carers who are Indigenous).

Table 5.12 Caring responsibility, by Aboriginal or Torres Strait Islander status, percentages, 2011

	Aboriginal or Torres Strait Islander	Non-Indigenous
No caring responsibilities	57.3	63.3
Informal caring responsibility	5.9	6.6
Child care responsibility	28.1	24.9
Dual caring responsibility	8.6	5.3

Source: ABS, 2011 Census, TableBuilderPro.

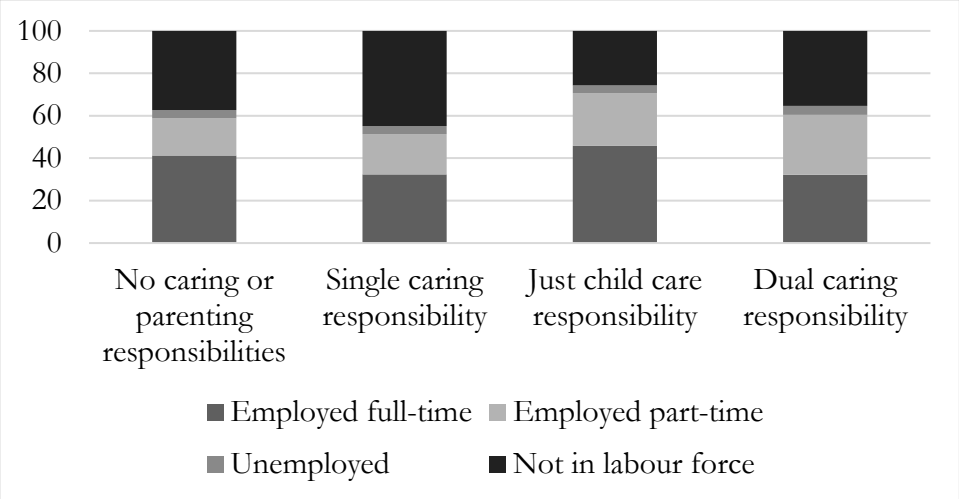
The primary difference between the two groups is obvious; Australians identifying as Aboriginal or Torres Strait Islander report providing all types of care more frequently than non-Indigenous Australians. Non-Indigenous Australians therefore have a larger share of those with no caring responsibilities. Looking at dual care specifically, 8.6 per cent of Indigenous Australians report providing dual care compared to 5.3 per cent of the non-Indigenous population. The fact that Australians who are Aboriginal or Torres Strait Islander report providing more care in general, and more dual care specifically, than the non-Indigenous population do is an interesting finding which warrants further investigation. Unfortunately, this further research is outside of the limitations of this thesis, due to the very small number of Australians identifying as Aboriginal or Torres Strait Islander in the HILDA data set. It does, however, present an opportunity for further research.

Socio-economic characteristics

The final collection of variables to be examined from Census data are those regarding socio-economic characteristics. As was the case previously, the characteristics investigated are income, employment status and educational attainment.

Figure 5.12 outlines the employment status of each caring group. The unique differences in employment for dual carers that are evident in the HILDA figure (the highest proportions of unemployment and part-time employment) are not as evident in the Census data.

Figure 5.12 Employment status by caring responsibility, percentages, 2011



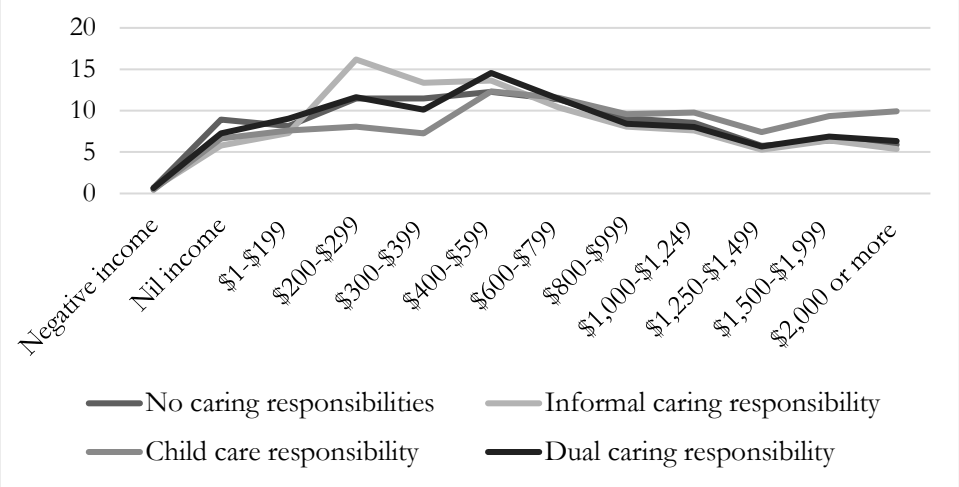
Source: ABS, 2011 Census, TableBuilderPro.

Unemployment is roughly the same across all caring responsibilities, at around four per cent. Dual carers do report high levels of part-time employment, but they are tied with child carers for the largest share. Similar to the results from HILDA, Figure 5.12 shows that those with child care responsibilities have the largest percentage of full-time employment, while informal carers exhibit the biggest share being out of the labour force. With the exception of

unemployment, the employment status of the different caring responsibilities is similar across the two data sets.

Following on from employment status, the next figure, Figure 5.13 illustrates the distribution of weekly income for each caring group. The Census data used in this figure has some differences to the corresponding HILDA figure. Firstly, Figure 5.13 uses weekly income (not annual disposable income) and secondly it is not divided into income quintiles. Despite these differences, we are still able to make comparisons about the general distribution of income between the caring groups, and between the two data sets.

Figure 5.13 Distribution of weekly income by caring responsibility, percentages, 2011

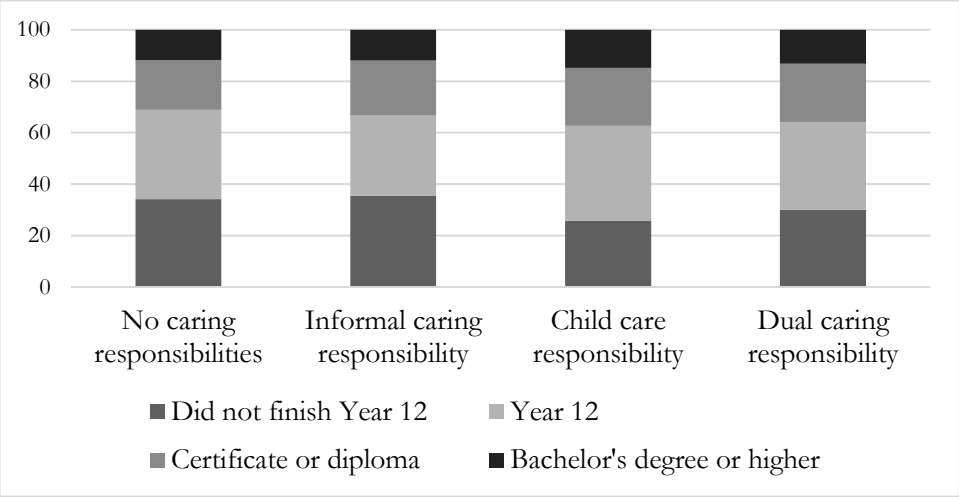


Source: ABS, 2011 Census, TableBuilderPro.

Similar to the HILDA data, child carers show the largest percentages of the highest income levels. Informal carers also exhibit a peak at the lower end of the income distribution that is not demonstrated by the other caring groups. As was the case with the HILDA data, dual carers do not appear to be generally wealthier or poorer than other caring groups in terms of income, peaking at the mid-level incomes.

The final variable to be investigated within the Census data set is education level. Figure 5.14 presents the breakdown of educational achievement by caring responsibilities. This figure is slightly different to the corresponding HILDA figure as it illustrates educational achievement, not highest education level attained.

Figure 5.14 Educational achievement by caring responsibility, percentages, 2011



Source: ABS, 2011 Census, TableBuilderPro.

The biggest difference between the two data sets is the higher proportions (in all caring responsibilities) of those with Year 12 education. This is because Census data reports educational achievement as two separate variables (education up to Year 12 and education beyond Year 12). As a result, those with both Year 12 qualifications, and qualifications beyond Year 12 are 'double counted', making the proportion with Year 12 qualifications much larger than it is in the corresponding HILDA figure. This is a limitation of the research which I was not able to rectify due to a lack of access to person level Census data. Aside from this difference, the patterns between the two data sets are similar. Child carers once again demonstrate the highest proportion of Bachelor's degrees or higher, and informal carers (closely followed by those

with no caring responsibilities) exhibit the highest rates of not having finished Year 12.

The impact and implications of differences between HILDA and Census data

The above discussion demonstrates that including grandparent carers in the child care and dual care variables would likely have some significant impacts. Many (but not all) of the differences between HILDA and Census data in terms of caring responsibilities can theoretically be traced to this key difference of operational definitions. Those that are not attributable to those operational differences are likely due to the increase representativeness of the Census compared to HILDA.

To re-iterate, the key difference in operational definitions used in the two data sets is found in the definition of child care responsibilities, which flows onto the definition of dual care responsibilities. HILDA data restricts the definition of child care responsibilities to a conservative measure of those with living with their own children, whereas Census uses a much more inclusive definition, including all who provide care to any children (their own and/or others). It was speculated that this difference would particularly impact grandparents providing child care to their grandchildren, as they would be included in the Census analysis, but not the HILDA analysis.

The first and most striking difference between the two data sets is found in the number (and percentages) of each type of caring responsibility. Census data indicates lower shares of the Australian population with no caring responsibilities, slightly higher shares of those with child care responsibilities only, and more than double the percentage of dual carers than the analysis of HILDA data suggests. The second key difference between the two data sets is the age structure of each caring responsibility. HILDA illustrates a clear peak at ages 30-44 and sharp decline immediately after for dual carers, whereas

Census data suggests a smoother age structure with higher shares at the older age groups (though still peaking at the key child-rearing ages). Despite this difference, in both data sets the dual care age distribution most closely resembles the age structure of child carers.

Differences that are likely attributable to the increased representativeness of Census data (rather than differences in operational definitions) include higher born overseas percentages (for all caring groups), more Australians with poor English skills (for all caring groups), and a larger share of those living in city and remote areas (again, for all types of caring responsibilities) in analysis of Census data. In addition to those differences, the increased representativeness of Census data allows for a brief examination of Aboriginal and Torres Strait Islanders, who demonstrate higher percentages of all types of caring responsibilities than non-Indigenous Australians.

Other variables which show very similar patterns to HILDA data include sex, relationship status, employment status, income, and education levels. HILDA data also allows for investigation of life satisfaction and general health and wellbeing. A comparison between those findings with Census data is not possible because Census does not provide that information. Additionally, Census data is not able to contribute to the discussion of care in a longitudinal sense; this includes patterns of caring over time, spells of dual care and entry to dual caring.

Conclusion

The analysis of HILDA and Census data in this chapter has supported the idea that dual carers have unique characteristics. Specifically, dual carers are different in a number of ways to those with only informal care responsibilities, those with child care responsibilities only and those with no caring responsibilities.

There were some significant in differences in the findings using HILDA data compared to Census data. Some of the findings from HILDA were not replicable with Census data, specifically those using multiple waves or questions about life satisfaction, health or wellbeing. Looking at the longitudinal data, analysis of HILDA indicated that all four types of caring responsibilities have remained fairly constant over the time period examined (2005 to 2013). Additionally, examination of spells of dual care illustrates that there is not a lot of movement in and out of dual caring responsibilities; most dual carers experience only one or two spells of dual care. Longitudinal analysis of entry to dual care (how Australians become dual carers) also demonstrated that entry from child caring (by acquiring an informal caring responsibility) is by far the most common entry method. Entry from child care was the entry method for such a majority of dual carers that there was not enough variation for further analysis of the impacts of type of entry to dual care.

Analysis of the characteristics of different caring groups showed that dual carers are unique. In the analysis of HILDA data, dual carers exhibited the highest proportions of women and were more likely to be partnered than most (excepting child carers). When sex and relationship status were considered together, dual carers had the highest proportion of partnered women. Dual carers demonstrated a unique age structure (peaking at ages 35-44), they reported the largest proportion born in Australia, but the highest proportion of those who do not speak English well. In terms of socio-economic characteristics; dual carers (somewhat counter-intuitively) showed high proportions of higher incomes, but also reported the largest proportions of unemployment and part time employment. It was suggested that lack of control variables (such as sex, age etc.) could have skewed the income results. This will be accounted for in further analysis. Education levels of dual carers did not appear to be particularly high or low in comparison with the other caring responsibilities. Finally, examination of life satisfaction and health and

wellbeing measures demonstrated that dual carers reported lower life satisfaction scores, lower levels of mental health, physical health, emotional wellbeing and social wellbeing than Australians with other (or no) caring responsibilities. Overall, dual carers seemed to share the most characteristics with child carers (compared to those with no caring responsibilities or those with informal caring responsibilities).

The second section of this chapter presented the same results as the first, using Census data in the place of HILDA data. Replicating (as far as possible) the same cross-sectional analysis using Census data allowed an insight into the possible implications of the operational definitions of key variables, specifically the child care and dual care variables. The analysis showed that there were some significant differences in the proportions in each caring group, and in the prominent demographic and socio-economic characteristics of each caring responsibility. These differences were summarized in the final segment of the previous section. Overall, it can be said that a more inclusive measure of child care (and thus dual care) which includes grandparents providing care to grandchild does significantly impact what dual care 'looks like' in Australia. Although there is not a lot to be done about these differences (the HILDA operational definitions are constrained by what is available in the data), it is important that the impact of a conservative measure is understood and communicated whilst interpreting the results of this research. In addition to understanding the limitations of the key operational definitions of this research, the comparison between HILDA and Census data also provided an insight into other areas which HILDA data may not adequately address. A key example of this is the examination of Australians identifying as Aboriginal or Torres Strait Islander.

The presentation of cross-sectional analysis in this chapter provides a solid starting point for further analyses. Taking into account the differences between HILDA and Census, there are clearly some characteristics which are

unique (or more prevalent) in the dual caring population. This provides justification for further analysis uncovering the unique predictors and impacts of dual care. The next chapter, Chapter Six – The Predictors of Dual Care, begins this more complex level of investigation by exploring which characteristics increase the likelihood of Australians becoming dual carers.

Chapter Six – The Predictors of Dual Caring

Introduction

The key aim of this thesis is to reveal if dual carers are different from the rest of the Australian population. The first research question asks what the predictors of dual care are; and how are they different from the predictors of other caring responsibilities? It is this sub-question which is addressed in this chapter. The characteristics that increase the hazard of providing dual care, as well as those that impact the hazard of informal care and child care are investigated through the use of event-history analysis, specifically discrete time hazard models.

The chapter begins by presenting the methodology of event-history analysis, stating the definitions of the approach itself and briefly reviewing its purpose and limitations. The variables used within the event-history analysis are described. Additionally, the methodological information presented here involves the specifics of the discrete-time hazard models. This includes information on how the metric for time within the models was chosen, as well as the specific equations for each discrete-time hazard model.

In order to investigate the predictors of each type of caring responsibility (dual care, informal care and child care), the results of three separate discrete time hazard models are presented. Each caring event requires its own model to ascertain the hazard of experiencing the event, depending on a wide range of predictor variables. This means that effects of differing predictor variables are investigated separately for dual care, informal care and child care. Although the models are run separately, for ease of interpretation they are presented together in this chapter. This presentation of results will begin with

a table showing the aggregated results of all three models side by side. This allows the predictive power of each independent variable to be viewed in comparison across the three caring responsibilities. Following the presentation of this table, each independent (predictive) variable is examined separately. The order of these variables follows roughly the order of variables in the previous chapter; beginning with demographic characteristics and finishing with socio-economic characteristics. The demographic characteristics whose predictive powers are explored through the discrete time hazard models include; age, sex, relationship status, the interaction of sex and relationship status together, country of birth, English proficiency and type of area lived in. The socio-economic predictors investigated are employment status, income and education level. In addition to presenting and interpreting the results of the discrete-time hazard models, this chapter also discusses how those results either confirm or contradict the expectations set in earlier chapters (the literature review and 'snapshot' analysis).

The results presented in this chapter strongly support that dual care is different from other types of care in terms of the characteristics which predict its occurrence. It is shown that age, sex, relationship status, employment status and education level are all significant and unique predictors of the hazard of providing dual care. It is also demonstrated that the predictors of the hazard of informal care and child care differ from dual care in significance, direction and strength on a number of variables.

Overall, the examination of the discrete time hazard models demonstrates that; being female, partnered, aged 25 to 54 in general and 34-44 specifically, being unemployed, employed part-time or being out of the work force and not having a Bachelor's degree or higher all significantly increase the hazard of becoming a dual carer.

Method

Event-history analysis

Event-history analysis is used when researchers have questions about *whether* an event will occur and *when* an event will occur (Singer and Willett 2003). In this research, event-history analysis is used to discover *whether* or not Australians become dual carers, given their other characteristics. As well as asking whether Australians become dual carers (based on other characteristics) this research also predicts two other caring behaviours (informal care and child care) and investigates how their predictors differ from the predictors of dual care.

Given that there are three types of caring responsibilities, there are three events of interest. These are becoming a dual carer, becoming an informal carer and becoming a child carer. A separate branch of analysis is conducted for each caring responsibility. Within each analysis, the hazard of experiencing the event (becoming that type of carer) is established, given a number of other independent variables. Constructing three separate models was essential due to the fact that there is significant overlap in the caring variables. If one single model was used, respondents would drop out of the analysis at the experience of their first caring event, not remaining in the analysis to experience dual care. By using three models, event-history analysis allows us to see what characteristics make people more likely to become dual carers, informal carers or child carers.

It is important to reiterate at this point that the language of event-history analysis is inherently negative (with terms such as hazard, survival and risk) due to its basis in mortality studies (Hosmer, Lemeshow et al. 2008). In this original use, experiencing the event of interest literally meant dying. Although this nomenclature seems to assign a negative value to the event in question, it is unequivocally not intended to assign value. This is of particular concern

giving the history of care as outlined in Chapter Two – The Concept of Care. Caring has, in the past, been unfairly labelled as a burden and it is not the aim of this thesis to perpetuate this outdated mode of thinking. I therefore state clearly here that although the nomenclature of event-history analysis appears to assume the provision of any care is a negative event, this is not my view, nor is it an assumption of this research.

Limitations of event-history analysis

The limitations of event-history analysis are primarily the same as those already presented for longitudinal analysis as a whole. In addition to the issues of attrition and unknown order of events between time points, there are two more limitations that are specific to event-history analysis. These are the measurement of time and the fact that event-history analysis only measures the first reported event (of caring). The first issue, measurement of time revolves around the choice of time metric for the event-history analysis. This choice and the limitations inherent in both options are fully discussed in a subsequent section of this chapter.

The second limitation, that event-history analysis measures time to first reported event, is only an issue in that I must be clear that the models do not predict dual caring in a general sense (across the life course). Rather, the event-history analysis predicts the first caring event. Therefore, for people that provide dual care early in life, then again later in life, the second spell of dual care would be excluded. This is only a minor issue, as it has been demonstrated that most dual carers experience only one 'spell' of dual care in their time in the HILDA survey.

Equations of the event-history analysis

In order to fully understand how event-history analysis works in general, and how the discrete-time hazard model has been used in this thesis specifically,

the following section presents relevant equations and explanations. This will begin with the basic concepts of the hazard function and the survivor function. Although the sample hazard and survivor functions for the different caring responsibilities are not presented in this thesis they do conceptually inform the discrete-time hazard model, an explanation of these concepts is therefore still useful. Following those explanations, the discrete-time hazard model will be presented in depth.

The hazard function

The starting point for understanding more complex discrete-time hazard models is the basic hazard function. The hazard function is denoted as $h(t_{ij})$. It is defined as "The conditional probability that individual *i* will experience the event in time period *j*, given that he or she did not experience it in any earlier time period"(Singer and Willett 2003). The following equation is a re-expression of this statement:

$$h(t_{ij}) = \Pr[T_j = j | T_j \geq j]$$

In this research, the hazard function shows the hazard, or risk, of an individual becoming a carer (either a dual carer, an informal carer or child carer) in each year, given that the individual has not already become the type of carer being examined. The hazard function for each year is calculated by dividing the number of individuals who experience the event in the year in question by the total number of individuals at risk of experiencing the event in the same time period. This equation is expressed as follows:

$$\hat{h}(t_j) = \frac{n\ events_j}{n\ at\ risk_j}$$

Because of the condition that the individual must not have experienced the event in any other time period, the variables used in this analysis are constructed so that people who experience the event in their first appearance

(wave 5 for most, various waves for late entrants) are dropped. In addition, once individuals have experienced the event, they 'die'; meaning they then drop out of the remaining waves after their first experience of the event. For example, when looking at dual carers, those who are already dual carers in the first wave they appear will be dropped from the sample. Then, once people become dual carers they are dropped out of the survey for all subsequent waves.

The survivor function

The key difference between the hazard and survivor functions is that the hazard shows the risk of experiencing the event in question in a specific time period, whereas the survivor function demonstrates the cumulative probability that an individual *will not* experience the event until the given time period. Singer and Willett (2003) describe the survivor function as "the probability that individual *i* will survive past time period *j*". This statement is expressed as follows:

$$S(t_{ij}) = \Pr[T_i > j]$$

The survivor function is calculated by dividing the number of individuals who have not experienced the event by the end of the time period in question by the total number of individuals in the data set. See the following equation:

$$\hat{S}(t_j) = \frac{n\ who\ have\ not\ experienced\ the\ event\ by\ the\ end\ of\ time\ period_j}{n\ in\ the\ data\ set}$$

Overall, the key difference between the two functions is that hazard deals with contemporary event occurrence, whereas survival is about cumulative event non-occurrence.

Basic hazard and survivor functions were performed prior as part of the background research of this thesis. However, the results of those analyses are

not presented here. Given that they are simply descriptive tools; a more complex model is required to properly investigate the ways in which different characteristics predict caring responsibilities. Now that these two more basic concepts have been explained, the more complex discrete-time hazard model may be discussed.

The discrete-time hazard model

The purpose of the discrete-time hazard model is to establish why certain events occur (or not) at different times for different people (Rabe-Hesketh and Skrondal 2012). In this thesis, the discrete-time hazard model answers questions about how different characteristics (also referred to as independent or predictor variables) increase the risk of individuals taking on different types of caring responsibilities.

The discrete-time hazard model equations estimating the hazard of experiencing each caring event are long and complex. For this reason, I will begin explaining the discrete-time hazard model using a general equation, which does not specify the actual variables included in the models used. The specific variables used within each model will still be presented following the explanation of the general equation for the discrete-time hazard model. The general equation for the discrete-time hazard model is expressed as follows:

$$logit\ h(t_j) = \left[\alpha_0 ONE + \alpha_1 (TIME_j - c)\right] + [\beta_1 X_{1i} + \beta_2 X_{2ij} + \cdots + \beta_P X_{Pij}]$$

The first set of square brackets in the equation restates the specification for time that was previously discussed. Simply put, it uses year of survey and constrains the effects of time to be linear. In more technical terms, the α's in the first brackets are the intercept parameters, which show the log odds of event occurrence in the given time period when the other predictive variables are 0. The second set of brackets represent those other predictive variables used within each model. These β values are the slope parameters and they

demonstrate the effect of a one unit difference in that predictor on event occurrence, whilst controlling for the other predictive variables. The predictor variables can be time variant or invariant, meaning their values can change over time (variant) or remain constant (invariant). Time invariant variables (such as country of birth) are represented by the first β term, and time variant variables (such as age or employment status) are represented by the second and final β terms. There are many more time variant variables within the discrete-time hazard models than those whose values remain constant.

There are three separate discrete-time hazard models used in this thesis to assess the hazard of taking on different caring responsibilities. The first model assesses the hazard of becoming a dual carer, the second investigates the hazard of becoming an informal carer and the third addresses the hazard of becoming a child carer. Though there are separate models, I have included the same set of predictive variables in each model so their effects on each type of caring responsibility can be easily compared. The independent variables included in each model are illustrated in Table 6.1.

Table 6.1 Independent variables for the discrete-time hazard models

Variable	Description
Time	Year of survey, constrained to be linear)
Age	Ten-year age groups. Ages 15 to 24 (reference group)
Female	Male (reference group)
Lives with a partner	Not living with a partner (reference group)
Sex by relationship status	Interaction term for sex and relationship status. Single men (reference group)
Born overseas	Born in Australia (reference group)
Does not speak English well	Speaks English well (reference group)
Lives in regional area	Live in city area (reference group)
Lives in remote area	Live in city area (reference group)
Employed part-time	Employed full-time (reference group)
Unemployed	Employed full-time (reference group)
Out of the labour force	Employed full-time (reference group)
Income	Disposable income, continuous variable
Finished Year 12	Did not finish Year 12 (reference group)
Certificate or diploma	Did not finish Year 12 (reference group)
Bachelor's degree or higher	Did not finish Year 12 (reference group)

The specification of the reference group for each (non-continuous) variable is important for the interpretation of results. The reference group is essentially the group that the effects of the predictors are being compared to. For example, the models give the hazard of becoming a carer for women, compared to men, or the hazard of being aged 35 to 44, compared to being aged 15 to 24. It is also important to note here that the presence of an interaction term (sex by relationship status) impacts the way in which the main effects of sex and relationship status are interpreted as separate variables. This will be further explained in the following discussion of the results of the discrete-time hazard models.

Caring variables in the discrete-time hazard models

The three key variables of interest in the discrete-time hazard models refer to caring responsibilities; dual care, informal care and child care. For use in the discrete-time hazard models, these variables are constructed with some differences compared to earlier and later analyses. Firstly, three separate dichotomous variables were created; dual care, informal care and child care. In each variable, respondents are coded as '1' if they are experiencing the event in question (providing the type of care specified in the name of the variable), and coded as '0' if they are not.

One of the unique features of caring in the event-history analysis is that respondents who already occupy the caring role in question when they first appear in the analysis must be excluded. Event-history analysis measures time to becoming a carer, and time to an event cannot be measured if the event is already happening at the beginning of a respondent's time (Singer and Willett 2003). In addition to this, after respondents experience the event they must be dropped in all following waves in which they appear (Rabe-Hesketh and Skrondal 2012). Therefore, for use in the discrete-time hazard models, the three caring variables are constructed so they exclude (by coding as missing) those who provide the relevant type of care in their first appearance. Additionally, once respondents have experienced the event (provided care) they are coded as missing in all subsequent waves.

The time metric

The choice for a suitable metric for time in the event-history analysis is complex and requires detailed explanation. There are two factors to consider in making this decision. Firstly, the choice had to be made between age of respondents or year of survey as the time metric. Age of respondents is an attractive choice as it allows for clear answers about when *across the life course* Australians are most at risk of taking up different caring responsibilities

(depending on other key variables). On the other hand, using year of survey as the time metric means that the results will show when *over the eight years of the HILDA survey* Australians are most at risk of providing care (depending on other key variables). Age can be included as age groups in that group of other key variables, but it would not be as clear as having it as the time metric. It has already been stated that year of survey was eventually chosen as the most appropriate time metric. The reason behind this choice is that all event-history analyses must have a clear 'beginning of time' when the clock starts for all respondents (Singer and Willett 2003, Allison 2010). The first wave of HILDA is cross-sectional, meaning respondents are at all different ages in the first wave. The use of age as the time metric in a event-history analysis using HILDA data would therefore only be appropriate if all respondents were the same age in the first wave.

The second consideration on choosing a time metric is the constraints placed upon time (using year of survey) within the models. There are a few different options regarding how to represent time in the discrete-time hazard models. The effects of time can be constrained to be constant, linear, quadratic, cubic (and so on) or they can be allowed to be completely general. In order to decide how to treat time, I ran a series of models trialling each approach. The equations for these models are illustrated in Table 6.2.

Table 6.2 Equations for alternative representations of time in the discrete-time hazard model

Constant	$logit\ h(t_j) = \alpha_0 ONE$
Linear	$logit\ h(t_j) = \alpha_0 ONE + \alpha_1 (TIME_j - c)$

Quadratic	$logit\ h(t_j) = \alpha_0 ONE + \alpha_1(TIME_j - c) + \alpha_2(TIME_j - c)^2 + \alpha_3(TIME_j - c)^3$
Cubic	$logit\ h(t_j) = \alpha_0 ONE + \alpha_1(TIME_j - c) + \alpha_2(TIME_j - c)^2 + \alpha_3(TIME_j - c)^3 + \alpha_4(TIME_j - c)^4$
Three stationary points	$logit\ h(t_j) = \alpha_0 ONE + \alpha_1(TIME_j - c) + \alpha_2(TIME_j - c)^2 + \alpha_3(TIME_j - c)^3 + \alpha_4(TIME_j - c)^4$
Four stationary points	$logit\ h(t_j) = \alpha_0 ONE + \alpha_1(TIME_j - c) + \alpha_2(TIME_j - c)^2 + \alpha_3(TIME_j - c)^3 + \alpha_4(TIME_j - c)^4 + \alpha_5(TIME_j - c)^5$
Completely general	$logit\ h(t_j) = \alpha_1 Year_1 + \cdots \alpha_j Year_j$

Choosing the most appropriate way to represent time in the discrete-time hazard models begins with comparison of the goodness of fit scores, specifically the deviance scores for each model. These scores are presented in Table 6.3. In terms of deviance scores, a lower score indicates a better fitting model.

Table 6.3 Comparison of alternative representations for the effect of time in a baseline discrete-time hazard model

Representation of time	n parameters	Deviance	Difference in deviance in comparison to: Previous model	General model	AIC	BIC
Constant	1	8512.13	-	186.31		
Linear	2	8510.46	1.67	184.64	0.07	-1473000
Quadratic	3	8495.64	14.83	169.82	0.07	-1473000
Cubic	4	8444.13	51.51	118.31	0.07	-1473000
Fourth order	5	8384.59	59.54	58.77	0.07	-1473000
Fifth order	6	8374.70	9.89	48.88	0.06	-1473000
General	9	8325.82	48.88	-	0.07	-1314000

Source: HILDA 2005 - 2013

The deviance scores show that the more 'freedom' allowed in the specification of time, the better the model fits, with the completely general specification receiving the lowest deviance score. Though the deviance scores do factor in the decision, the choice of the best model is not simply down to the model with the best goodness of fit scores (a completely general specification will always receive the lowest/best scores). There are other factors to take into consideration. Because dual care is a rare event (only a small minority of respondents ever become dual carers) within a large data set, small changes in the number of dual carers each year can appear as larger fluctuations in the hazard of caring over time. We know from the previous chapter that there is not all that much change in the rates of dual caring over the time period surveyed, the reviewed literature also provides no suggestion that there would be. As such, allowing time to be completely general may create the appearance that the hazard of dual caring is fluctuating wildly over time, when in reality it is not. Placing some constraints on the specification of time therefore seems

to be wise. Constraining the effects of time to be constant is too restrictive, but there does not appear to be much benefit (in terms of goodness of fit scores) in allowing it to vary using the higher powers (quadratic, cubic, etc.). Therefore, it was decided to constrain the effects of time to be linear.

Results

The results of three separate final models are presented in this chapter. The three models assess, separately, the hazard of becoming a dual carer, the hazard of becoming an informal carer, and the hazard of becoming a child carer. The results discussed demonstrate that the predictors of dual care are different to the predictors of informal and child care. The presentation of results begins with Table 6.4, which illustrates the results of each separate model side by side for ease of comparison. These results are discussed systematically by each predictive variable, beginning with time.

Table 6.4 Discrete-time hazard model results, time to caring event, odds ratios

	Dual care	Informal care	Child care
Time (year of survey)	1.03*	1.03**	1.04**
Aged 15 to 24 (ref)	1.00	1.00	1.00
Aged 25 to 34	3.63**	0.80	2.28**
Aged 35 to 44	7.60**	1.02	1.96**
Aged 45 to 54	4.07**	3.26**	0.25**
Aged 55 to 64	0.30**	4.05**	0.02**
Aged 65 to 74	0.11**	3.36**	0.00**
Aged 75 up	0.09**	2.85**	0.00**
Male (ref)	1.00	1.00	1.00
Female	5.91**	1.00	2.48**
Living with a partner	8.94**	0.89	20.90**
Female x partnered (interaction)	0.17**	1.42**	0.29**
Born in Australia (ref)	1.00	1.00	1.00
Not born in Australia	1.21	1.20**	1.07
Speaks English well (ref)	1.00	1.00	1.00
Does not speak English well	1.49	0.81	0.51*
Lives in city area (ref)	1.00	1.00	1.00
Lives in regional area	1.17	1.02	1.22**
Lives in remote area	0.72	0.95	1.16
Employed full-time (ref)	1.00	1.00	1.00
Employed part-time	1.95**	1.12	1.90**
Unemployed	4.50**	1.70**	1.86**
Not in the labour force	3.28**	1.25**	5.71**
Income	1.00*	1.00**	1.00**
Did not finish Year 12 (ref)	1.00	1.00	1.00
Finished Year 12	0.92	1.02	1.09
Bachelor's degree (or higher)	0.71**	0.97	1.20*
Certificate or diploma	0.90	1.06	1.35**

Source: HILDA 2005 - 2013

Time

The first item addressed in Table 6.4is the hazard of becoming a carer over time. Table 6.4 shows that the hazard of caring increases slightly over time for

all caring responsibilities. As previously stated, the effects of time on the hazard of care are constrained to be linear for all caring responsibilities. Accordingly, the results for time in Table 6.4 are continuous (that is, the hazard of care changes by the result for each additional year).

The hazard of becoming a dual carer and the hazard of becoming an informal both increase by 3 per cent each year, whereas the hazard of becoming a child carer increases by 4 per cent each year. These are very slight increases in caring over time, especially for dual care and informal care given the hazard of experiencing either of those events is already very low.

Looking back to the expectations set by the review of existing research into care in Australia, and the results of the snapshot analysis, it is not surprising that the discrete-time hazard models do not indicate any kind of major change in the hazard of providing care over time. The research reviewed in Chapter Three suggests that although there have been increases in the number of Australians providing various types of care, the proportions of people providing care have remained relatively steady. The snapshot analysis of Chapter Five also indicated that the proportions of Australians providing care have been stable over recent years. It should be noted here that the literature review in particular offered suggestions that caring is likely to increase in the future, due in most part to the ageing of the population. Indeed, the predicted increase in care needs in Australia is a foundation of the rationale for undertaking this research. The lack of major changes in the hazard of caring from 2005 to 2013 does not negate this prediction, as the ageing of the population is primarily associated with the entry of the 'baby boomer' generation into old age, which is yet to happen.

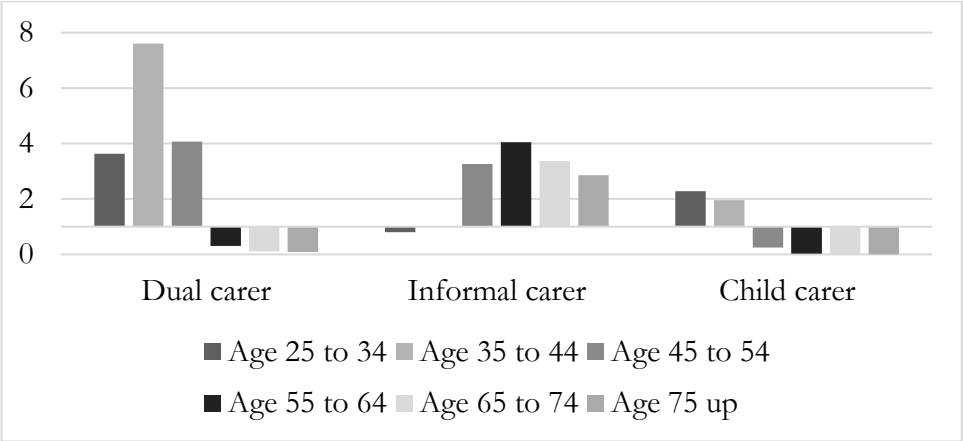
Demographic predictors of care

Age

The literature previously reviewed lead us to expect that the risk of informal caring would be highest at the mid to older age groups, and that the hazard of child care would be highest at ages 30-49, with a second (much smaller) peak at the older age groups if child care provided to grandchildren was included. There was no existing research examining the demographics of dual carers, but it was speculated that the age structure of dual carers would be young to middle aged, given that HILDA did not allow for the inclusion of grandparent child care. The results of the snapshot analysis in Chapter Five supported those expectations set by the literature review. The results of the discrete-time hazard models show clearly that age is a crucial predictor for the hazard of all types of care, and especially so for dual care.

The predictive power of age on the hazard of caring is assessed in Table 6.4, and presented visually in Figure 6.1. Age is included in the discrete-time hazard models as ten-year age groups, with ages 15 to 24 as the reference group.

Figure 6.1 Hazard of caring by age group, odds ratios



Source: HILDA, 2005-2013

It is worth restating here that because the hazards of dual caring, informal caring and child caring are estimated in separate models, a particularly high hazard for one age group for one type of care does not mean that the hazard of becoming that type of carer is highest for that age group. In other words, 25 to 34 year-olds are not most at risk of becoming dual carers, more so than becoming informal or child carers. Rather, it means that within the hazards of becoming a dual carer, the risk is 7.6 times higher of becoming a dual carer for 35-44 years than it is for 15 to 24 year-olds. With that caveat restated, the impact of age on predicting the hazard of caring can be discussed.

Looking at the hazard of dual care first, the results in Table 6.4 show that all age groups are significant predictors of becoming a dual carer. By far the biggest predictor is being aged 35 to 44. People in this age group are 7.6 times more likely to become dual carers than those aged 15 to 24. Those aged 25 to 34 and 45 to 54 are both around four times more likely to become dual carers than those aged 15 to 24. Belonging to any age group over 55 years reduces the hazard of becoming a dual carer.

Informal carers show a different pattern in their hazard of caring. The younger age groups are not significant predictors of the risk of informal care,

however all ages above 45 significantly increase the hazard of informal care (compared to those aged 15 to 24). Those later age groups increase the hazard by nearly three to four times as much. Those aged 55-64 demonstrate the highest risk.

As was the case for the hazard of dual care, all ages significantly predict the hazard of becoming a child carer. However, the patterns of risk exhibited are quite different. Compared to 15 to 24 year-olds; those aged 25 to 44 are approximately twice as likely to become child carers. Belonging to any age group over 45 significantly reduces the risk of taking on a child care responsibility. Overall, the results of the discrete-time hazard models support the anticipated relationships between age and caring, although the strength of age as a predictor for dual care was unexpected.

Sex and relationship status

The results for sex and relationship status are presented together due to the inclusion of an interaction term between the two. When an interaction effect between two variables is included in a model, the main effects of those variables cannot be considered in isolation. Rather, they are interpreted in conjunction with the relevant interaction term. Because of this increased complexity in interpretation, I have presented these results as both a table (Table 6.5), and as a figure (Figure 6.2). Table 6.5 shows how belonging to one of four possible sex/relationship combinations can predict the hazard of becoming a carer. Those four combinations are single men (who form the reference group), single women, partnered men and partnered women.

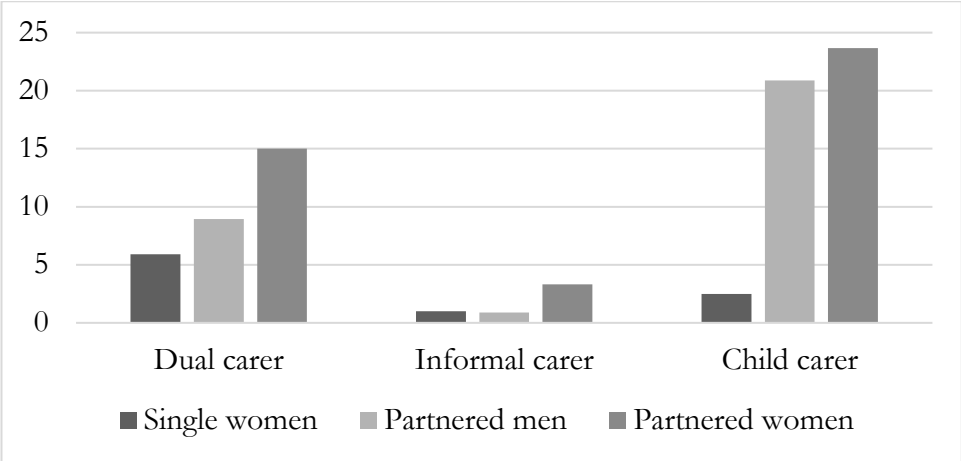
Table 6.5 Hazard of caring by sex and relationship status, odds ratios

	Dual care	Informal care	Child care
Single men (ref)	1.00	1.00	1.00
Single women	5.91	1.00	2.48
Partnered men	8.94	0.89	20.90
Partnered women	15.01	3.32	23.67

Source: HILDA, 2005-2013

It is evident that for all types of caring responsibilities, partnered women have the highest hazard of becoming a carer. For the hazard of dual care, being a partnered woman increases the risk the most; they are 15 times more at risk than single men. Partnered men are nearly nine times more likely and single women are almost six times as likely to become dual carers than single men are. The results of the informal care model are less reliable as the main effects of sex and relationship status are not significant (though the interaction term was). However, it is clear that being a partnered woman carries a higher hazard of informal caring than being a single man does. The results of the child care model are all significant for sex and relationship status, as is the case for the dual care model. They demonstrate a similar pattern as the dual care model, although being partnered seems to be the key factor in increasing the hazard of child care. Partnered women experience a hazard almost 24 times higher than single men, and the hazard for partnered men is nearly 21 times higher. Single women are also two and a half times more at risk of becoming child carers than single men are. The results of Table 6.5 are illustrated visually in Figure 6.2.

Figure 6.2 Hazard of caring by sex and relationship status, odds ratios



Source: HILDA, 2005-2013

The increased risk of partnered women providing all types of care was predicted in both the literature review and the snapshot analysis. Indeed, the strong indications of the gender imbalance in caring and the relationship status of carers in previous studies and the snapshot analysis is the reason why an interaction term between sex and relationship status was included. After examining the results of the discrete-time hazard models, there are still some remaining questions as to why the hazard of informal care was not as well predicted by sex and relationship status. I suspect that this is to do with age. Specifically, previous literature suggested that the provision informal care may increase for partnered men at older age groups. Due to the tendency of men to partner slightly younger women, and the longer life expectancies of Australian women (compared to men), there are more men at the older ages groups who still have a partner to whom they could provide care. This could, theoretically, increase the hazard of informal care for partnered men, but only at the older age groups.

To further investigate this idea, I included a more complex three-way interaction term between sex, relationship status and age. Unfortunately, all

interactions attempted using the age variable were unviable due to a small cell problem.

Country of birth

The results for country of birth are not illustrated in their own table or figure as country of birth was only a significant predictor in the informal care model. For this variable, being born in Australia is the reference group, which means that being born outside of Australia increases the hazard of becoming an informal carer by approximately 20 per cent. Country of birth is not a significant predictor for the hazard of dual care or child care.

The relationship between country of birth and the provision of care is not featured in the literature review as it is generally not the focus of existing research. The snapshot analysis indicated that slightly more dual carers are born in Australia than are born overseas. Given that the discrete-time hazard model controls for other variables, and tests for significance, it seems unlikely that there is any meaningful relationship between country of birth and the hazard of dual care.

English proficiency

Similar to country of birth, English proficiency is only a significant predictor in one of the caring models, as such it is not necessary to illustrate it in a separate table or figure. The model that English proficiency does significantly predict the provision of care is the child care model. This model shows that respondents who report not speaking English have a lower hazard of becoming a child carer by 49 per cent. English proficiency does not significantly predict the hazard of either dual care or informal care.

Also similar to country of birth, English proficiency did not feature in the reviewed literature. The cross-sectional analysis of Chapter Five suggested that a slightly larger proportion of dual carers had poorer English skills than those with other types of caring responsibilities, but once again, as the discrete-time

hazard model controls for other variables and tests for significance, it is unlikely that English proficiency has any predictive power for the hazard of dual caring.

Type of area lived in

There are three variables presented which represent the type of area lived in. They are; city area, regional area and rural area. City area is the reference group, so it is in comparison to this group that the hazard of caring is measured. Once again, this variable only proves to be a significant predictor in one of the caring models, and then for only one type of area. This is the child care model, and living in a regional area. The hazard of becoming a child carer is 22 per cent higher for Australians living in regional areas than it is for those living in city areas. The type of area lived in does not appear to significantly predict the hazard of becoming either a dual carer or an informal carer.

As is the case for the two previous variables, the literature review does not offer any speculation about the role of type of area lived in for predicting the hazard of caring. As such, the results presented here do not contradict or support any previous findings or speculation.

Socio-economic predictors of care

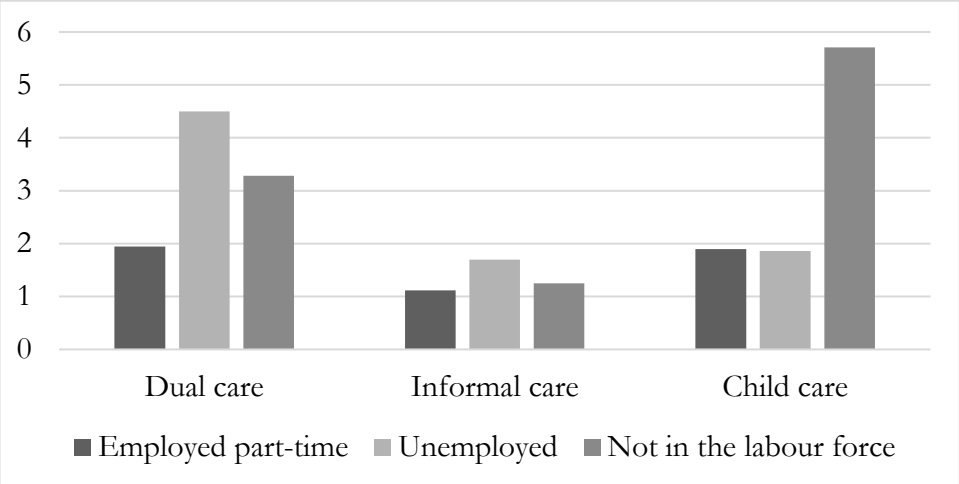
Employment status

Employment status is one area in which its relationship to the provision of care has been thoroughly investigated in the previous literature (at least for informal and child care). On the whole, the literature review suggests that the provision of informal care is strongly associated with unemployment, part-time employment and being out of the labour force. The research is somewhat divided regarding the direction of causality in that relationship. Given that the majority of the reviewed research is based on cross-sectional studies, much of that literature is unable to comment beyond the existence of a relationship between employment and informal care. The relationship in the

existing literature between employment and child care focuses more on the gender differences between parents. It has been clearly established that women with child care responsibilities are more likely to be involved in part-time employment than fathers or women without children. Although there is no equivalent existing research for dual carers, it was speculated that dual care would see an even stronger association with lower employment levels. The snapshot analysis of the previous chapter supports this theory. The results presented in this section begin the investigation of the direction of causality.

The results of Table 6.4 demonstrate that employment status is a significant predictor of the hazard of all three caring responsibilities. Being employed full-time constitutes the reference group for this variable, which means the hazard of all other employment statuses are interpreted in comparison with being employed full-time. The hazard of caring is illustrated for employment status in Figure 6.3.

Figure 6.3 Hazard of caring by employment status, odds ratios



Source: HILDA, 2005-2013

Looking first at the dual care hazard model, we can see that being unemployed most significantly increases the risk of becoming a dual carer. Specifically, Australians who are unemployed are at a risk of four and a half

times higher of becoming a dual carer than those who are employed full-time. Similarly, being employed part-time or being out of the labour force increases the hazard of dual care by over three times and nearly two times, respectively (comparative to full-time employment).

For informal care, the hazard of being unemployed and being out of the labour force are both significant, but being employed part-time is not a significant predictor. Being unemployed increases the risk of becoming an informal carer by 70 per cent, compared to being employed full-time. Being out of the labour raises the hazard of informal caring by 25 percent, again compared to full-time employment.

In the discrete-time hazard model for child care, all types of employment significantly predict the risk of providing care. Being out of the labour force is clearly the strongest predictor, with those out of the labour force being nearly six times more at risk of providing child care than those who are employed full-time. Those who are unemployed and those who are employed part-time are both approximately twice as likely to take on child care responsibilities than those who are employed full-time.

The results of the discrete-time hazard models clearly support the idea that employment status can determine the risk of taking on board different caring responsibilities. However, it is still possible that caring responsibilities will also impact employment status, this direction of the relationship is investigated in Chapter Seven – The Impacts of Dual Caring.

Income

There was a general consensus in the literature review that the provision of informal care is associated with lower income levels. The relationship for child carers seems to be dependent on the gender of the person providing care; with the income of fathers often increasing, but decreasing for mothers. Once again, the reviewed literature regarding income did not address dual care. The

distribution of disposable income by quintile in Chapter Five suggested that informal carers more often have lower incomes, whereas child carers are generally on the higher end of the income range. Those with no caring responsibilities demonstrated an even spread of incomes and dual carers most commonly reported incomes in the middle of the range. Neither the literature review nor the snapshot analysis offered significant insights regarding the direction of causality between income and caring responsibilities.

The results of the discrete-time hazard models for income indicate that income is a significant predictor of the hazard of all three caring responsibilities. The direction of its impact on each caring responsibility is not clear in Table 6.3, as all three results are rounded to 1.00. Although it appears that income significantly predicts no change at all, the reality for all caring responsibilities is a result so small that limiting the table results to two decimal points renders the change invisible. Increasing the decimal points visible to four allows us to see the direction in which income predicts caring responsibilities. These results are presented in Table 6.6.

Table 6.6 Hazard of caring by income, odds ratios

	Dual care	Informal care	Child care
Income	1.0001	0.9998	1.0003

Source: HILDA, 2005-2013

Inspection of the scores for income in each model with four decimal points visible shows that the while the hazard of dual caring and child caring increases as income increases, the risk of informal caring actually decreases as income rises. These increases and decreases may seem very small, but it is important to remember the scale of the variable in question when interpreting these kinds of results. The income variable is a continuous variable (disposable income) for all three models, and the unit of change in the income variable (the dollar) is very small. This means that a seemingly small result in

the discrete-time hazard model can actually add up to a reasonable amount of variance in hazard over the entire spread of the variable. However, even with this in mind, the impact of income on predicting the hazard of dual care, informal care and child care is still small.

Overall, the results of the discrete-time hazard model confirm the associations outlined in Chapters Three and Five – lower incomes for informal carer, and higher incomes for child carers. Higher incomes do not predict dual care as much as they predict child care. The results presented here suggest that at least some of the associations between income and care occur with income as the predictor. That is those with higher incomes are more at risk of becoming child carers or dual carers and those with lower incomes have a higher hazard of becoming informal carers. It is still possible that caring also impacts on income, this direction of the relationship is explored in the following chapter.

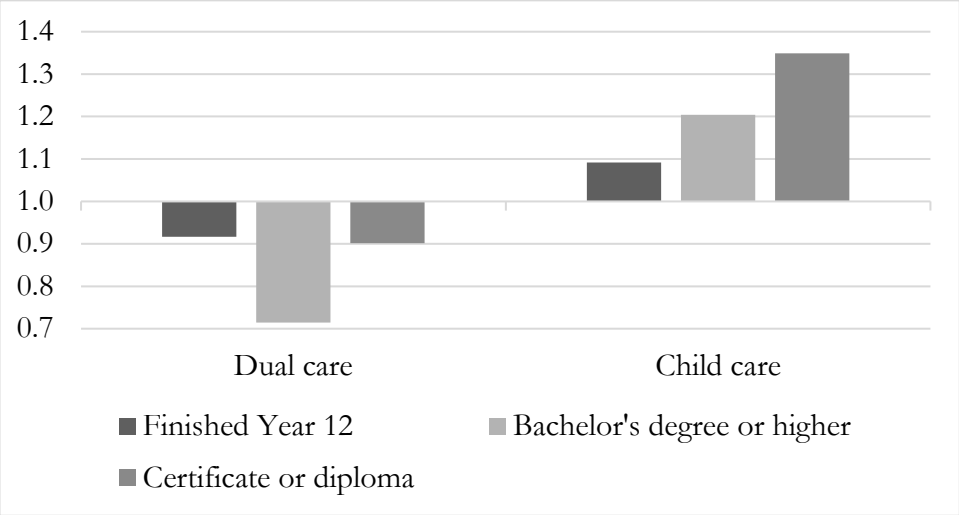
Education level

The final variable explored by the discrete-time hazard models is education level. The literature review suggests that informal carers would have lower levels of education than non-carers, and also raises the possibility that child carers would have lower levels of education than non-carers due to the higher opportunity cost of having children for those with higher levels of educational achievement. This leads to the expectation that dual carers, combining both types of care, would likely have even lower education levels. The snapshot analysis of Chapter Five does not offer support for any of those expectations.

The results presented in Table 6.4 indicate that education level is a significant predictor in the dual care and child care models, but not the informal care model. In other words, education does not seem to either increase or decrease the hazard of becoming an informal carer, but it does impact the hazard of dual care and child care. The hazard of caring by education level is illustrated

in Figure 6.4 (with the informal care model excluded, due to its lack of significant education level predictors).

Figure 6.4 Hazard of caring by education level, odds ratios



Source: HILDA 2005 - 2013

Within the dual care and child care models, not all types of education level are significant predictors of the provision of care. For both models, the risk of becoming a carer was not significantly different for those who completed Year 12 (compared to those who did not finish Year 12). In the dual care model, completing a Bachelor's degree or higher was the only significant predictor, with those who have attained a Bachelor's degree or higher having a nearly 30 per cent lower risk of taking on a dual care responsibility, compared to those who have not finished Year 12. Conversely, the child care model shows that the hazard of becoming a child carer is 20 per cent higher for those with a Bachelor's degree than it is for those who have not finished Year 12. Additionally, having a certificate or diploma increases the hazard of child caring by 35 percent. Referring back to previous literature and the snapshot analysis, one of the assumptions of the reviewed literature is supported, this is that higher education levels reduce the hazard of dual caring.

Conclusion

The analysis presented in this chapter has answered one of the key research questions of this thesis; what are the predictors of dual care, and how do they differ from the predictors of other caring responsibilities? The analysis performed has shown that there are certain characteristics which increase the hazard of taking on dual care responsibilities. It has also been demonstrated that those predictors of dual care are significantly different to the predictors of informal care and child care.

Before those conclusions were reached, this chapter outlined the methodological approach of event-history analysis, and provided an in-depth presentation of how this analytical approach facilitates the answering of the aforementioned research question. Key methodological decisions were explained and justification provided, such as the choice of a time metric and the classification of variables within the discrete time hazard models. Relevant model equations were also provided to facilitate further understanding of how event-history analyses in general, and discrete-time hazard models in particular, function. The use of three separate models to assess the hazard of providing dual care, informal care and child care was outlined. The implications of using three separate models were also discussed.

The discussion of the results of the discrete-time hazard models began with the presentation of Table 6.3, which aggregated the findings of all three models. This allowed for easy comparison of the predictors of each type of caring responsibility, as well as an overall view of which variables mattered more for predicting the hazard of each type of care. Those results were then systematically explored in detail by each key predictive variable. At times, the findings of the discrete-time hazard model complemented ideas raised in the reviewed literature review and the snapshot analysis. However, it was also the

case that the findings of this analysis demonstrated some very different relationships than what may have been expected.

The evidence presented here shows that the predictors of becoming a dual carer include; being female, being partnered (the risk is particularly high for partnered women), being aged 25 to 54 in general and 35 to 44 specifically, not being employed full-time (especially being unemployed) and not having a Bachelor's degree or higher all significantly increase the hazard of taking on dual care responsibilities. The risk of providing dual care also rises slightly as income increased. Prior to this research, the predictors of dual care were unknown. In addition to identifying the predictors of dual care, this research also reveals that those predictors are different to the predictors of other types of care. Informal care was shown to be predicted by not by sex or relationship status in general (with the exception of partnered women). Being aged over 45 increases the hazard of informal caring, particularly being aged 55 to 64. Being born outside of Australia increases the hazard of informal care, as does being unemployed or out of the labour force (but not being employed part-time). Finally, an increased income slightly reduces the risk of providing informal care. The final discrete-time hazard model showed the that hazard of providing child care is predicted by being female and being partnered, and similar to the other caring responsibilities being a partnered woman increases the risk even further. Unlike dual care sex is the weaker predictor of the two and relationship status a stronger predictor of providing child care. The other predictors of child care included; being aged 25 to 34, speaking English well, living in a remote area, not being in full-time employment (particularly being out of the labour force) having a higher income and having a certificate, diploma, Bachelor's degree or higher. Demonstrably, the predictors of dual care, informal care and child care are unique to each type of caring responsibility.

The research presented in this chapter extends our understanding of the predictors of providing dual care, informal care and child care. Given that this is the first Australian study to investigate the predictors of dual caring, the contribution to the study of care here is a significant one. Overall, the results presented here strengthen the idea that there are certain characteristics which increase the risk of Australians taking on dual caring responsibilities. The results of this analysis also supported the idea that the characteristics which predict dual care are different from the characteristics that predict informal or child care. Now that the predictors of dual care have been identified, the second key research question can be addressed. The following chapter, Chapter Seven presents the results of analysis identifying the impacts of providing dual care.

Chapter Seven – The Impacts of Dual Caring

Introduction

This chapter asks; what are the impacts of dual caring, and how are they different to the impacts of other caring responsibilities? Just as there are certain unique characteristics which increase the hazard of becoming a dual carer, the results presented in this chapter demonstrate that the experience of being a dual carer has unique impacts on those providing care. These impacts of dual caring have substantial effects on the lives of dual carers, and they are significantly different than the impacts of providing informal care or child care alone.

The chapter begins by presenting the methodology of multilevel modelling, this includes a general explanation of the approach itself, followed by a clarification of how multilevel models function in a longitudinal setting. In addition to the general methodological information, the specifics of the multilevel models as they are used in this thesis are presented. This includes specifying how the provision of care is represented within the models. The three types of multilevel models are explained, showing how they allow the exploration of changes in elevation, slope, and elevation and slope combined. Following this explanation, the rationale for selecting the best fitting type of multilevel model will be outlined. The final methodological section of this chapter describes the many non-caring variables that are used in the multilevel models.

The presentation of the results of this analysis begins with a table compiling the results of all multilevel models together. In contrast to the survival analyses, which required a separate model for each type of caring

responsibility, a separate multilevel is performed for each independent variable. However, the structure of the presentation of results will be similar as the results are separated and examined by the non-caring variables. The key difference between the two chapters is that in the previous chapter each non-caring variable was examined in terms of how it can *predict* caring responsibilities, whereas in this chapter, each non-caring variable is examined in terms of how it is *impacted* by different caring responsibilities. The variables examined in the multilevel models can be divided into four categories; demographic characteristics, economic characteristics, health and well-being indicators, and life satisfaction. The specific variables examined in this chapter are as follows; relationship status, employment status, income, general health and well-being, physical functioning, bodily pain, vitality, social functioning, emotional health, mental health, psychological distress, general life satisfaction, satisfaction with free time, satisfaction with health, satisfaction with employment opportunities, satisfaction with the home lived in, satisfaction with financial situation, satisfaction with feeling safe, satisfaction with feeling part of the local community, and satisfaction with the neighbourhood lived in.

The results presented in this chapter support the idea that dual caring has unique, and often negative, impacts on those who provide dual care. Specifically, it will be shown that dual caring lowers general life satisfaction as well as a number of specific areas of life satisfaction. It reduces general health and wellbeing and other specific measures of mental, physical, social and emotional health. Dual caring is also found to lower employment (initially) and living with a partner. It is also demonstrated throughout that the impacts of other caring responsibilities are different to the impacts of dual caring.

Method

Multilevel modelling

Multilevel modelling is the second longitudinal analytical technique employed in this thesis. Outside of longitudinal data, multilevel models are used to compare change at different levels or, in other words, to explore differences *within* groups and differences *between* groups (Rabe-Hesketh and Skrondal 2012). A classic example of this would be examining the grades of students across a number of schools. The first stage of multilevel analysis would allow researchers in that scenario to examine what characteristics of students correlate with good grades, for example, gender, education levels of parents, completion of homework etc. The second stage would examine the school level and show what school characteristics result in good grades, for example, being located in a high socio-economic area, having high teacher qualification standards etc.

When used with longitudinal data, multilevel modelling offers a unique way to understand change. Within longitudinal analysis, multilevel models allow researchers to investigate change *within* and *between* individuals over time (Singer and Willett 2003). Using the students within schools example, multilevel models using longitudinal data allow us to look at change within the repeated measurements of a respondent (the students) within and between each level (the school). These two types of change in longitudinal multilevel modelling are sometimes referred to as within-individual change and inter-individual change (Singer and Willett 2003). In other words, multilevel models allow us to investigate how events or characteristics of individuals impact on those individuals, both when they happen and over time. This makes multilevel models the most appropriate approach for answering the second key research question – what are the impacts of dual care, and how are they different to the impacts of other caring responsibilities?

Multilevel modelling clearly has useful applications in a longitudinal setting. For this analysis in particular it is used to explore change *within* four caring groups; dual carers, informal carers, child carers and non-carers (the reference group). It is also used to explore change *between* those four groups. By analysing the change within and between dual carers, informal carers, child carers and the non-caring population (the reference group) across a range of variables, this analysis reveals the impacts of dual caring and shows how they are different to the impacts of informal caring, child caring and having no caring responsibilities.

Limitations of multilevel modelling

The limitations of multilevel modelling are the same as those already outlined in the data chapter for longitudinal analysis as a whole. The multilevel models presented in this thesis must therefore be interpreted with the issues of attrition and unknown order of event between time points in mind. Once again, these issues are common to longitudinal analyses and do not prohibit meaningful results.

Caring in the multilevel modelling analysis

For the analysis presented this chapter, there are three caring variables used; dual care, informal care and child care. The multilevel models are run separately for each variable theorized to be impacted by the provision of those caring responsibilities. Caring responsibilities have the same four options as previous analyses; dual care, informal care, child care and no care responsibilities. Caring responsibilities are represented in the multilevel models through a series of three dichotomous variables, with those who provide the care in question coded as 1, and those who do not coded as 0. The three caring responsibility variables are; dual care, informal care, and child care. The non-caring population are not included as a separate variable and therefore serve as the reference group. This means that the impacts of each

caring responsibility on each dependent variable should be interpreted in comparison to those with no caring responsibilities. In addition to those dichotomous caring responsibility variables, variables showing caring responsibilities over time are also included. These variables show the interaction of caring status with time and are created by multiplying each of the caring status variables by the time variable. Once again, those with no caring responsibilities provide the reference category. The rationale for including predictive variables as both stationary points in time, and as variables over time is further explained in the following section.

General multilevel model equations

Although it is important to have a general understanding of how multilevel modelling works in order to understand the results presented later in this chapter, it is not essential to have a full comprehension of the details of the multilevel model equations. These detailed equations are provided for those who are either already familiar with multilevel modelling and would like to see exactly how it is applied in this thesis, or simply for those who are interested in developing a more comprehensive understanding of multilevel modelling in a longitudinal setting.

There are three key ways in which the multilevel model can examine change over time when using a time-varying predictor variable. The model can allow for a change in elevation, a change in slope or changes in both elevation and slope. Singer and Willet (2003) recommend visualising an individual trajectory of the dependent variable over time to understand the differences between these types of models. A change in elevation means that when the predictor variable changes values, the dependent variable can also exhibit an immediate change. This change in elevation does not affect the slope of an individual's trajectory, rather it makes it increase or drop, then continue on the same slope. A change in slope means that the model does not allow an immediate change in the dependent variable's value when the predictor variable changes

values, but it does allow the slope, or angle of the trajectory to change as time goes on. Finally, changes in both elevation and slope mean that the model allows changes in the predictor variable to change the projected values of the dependent value immediately and then continue to change (intensifying or weakening over time). The three key forms of the multilevel model equation will now be presented. Note that for ease of interpretation, these equations do not include terms representing additional predictive variables.

The multilevel model equation allowing for a change in elevation (but not slope) is as follows:

$$Y_{ij} = \left[Y_{00} + Y_{10}TIME_{ij} + Y_{20}CARE_{ij}\right] + \left[\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varsigma_{2i}CARE_{ij} + \varepsilon_{ij}\right]$$

The first set of brackets refers to the fixed effects of the multilevel model, and the second set refer to the random effects. It is the fixed effects portion of the model that is of particular interest to the results presented throughout this chapter. Within the first set of brackets the final term represents the change in elevation of caring status.

The multilevel model equation allowing for a change in slope, but not elevation includes a term that allows the effects of caring responsibilities to vary over time (care by time) but removes the term for care at a stationary point. The equation for a change in slope (but not elevation) is therefore:

$$Y_{ij} = \left[Y_{00} + Y_{10}TIME_{ij} + Y_{20}\left(CARE_{ij} \times TIME_{ij}\right)\right] + \left[\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varsigma_{2i}CARE_{ij} \times TIME_{ij} + \varepsilon_{ij}\right]$$

The third key form of the multilevel model equation is one which allows for changes in both elevation and slope. This equation includes the terms for care at a point in time as well as care by time. The equation allowing for changes in elevation and slope is as follows:

$$Y_{ij} = \left[Y_{00} + Y_{10}TIME_{ij} + Y_{20}CARE_{ij} + Y_{30}\left(CARE_{ij} \times TIME_{ij}\right)\right] + \left[\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varsigma_{2i}CARE_{ij} + \varsigma_{3i}CARE_{ij} \times TIME_{ij} + \varepsilon_{ij}\right]$$

When performing multilevel modelling on each of the dependent variables in question, a consistent method must be applied to ensure that each model used includes the most appropriate specifications of change. The following section describes this process.

Selecting the best fit model

In order to choose the most appropriate form of multilevel model for each dependent variable (on which the impacts of caring were being investigated), a series of nine separate models are applied. Decisions about the most appropriate models for each variable are made via comparison of the goodness-of-fit statistics of each model; specifically, the deviance statistics and AIC and BIC statistics. The equations for each of these models, along with their titles and descriptions are presented in Table 7.1

Table 7.1 Multilevel model equations

	Model description	Model equation
Model A	Baseline	$Y_{ij} = \left[Y_{00} + Y_{10}TIME_{ij} + Y_{20}CARE_{ij}\right] + \left[\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varepsilon_{ij}\right]$
Model B	Change in elevation, not slope. Allowing care to vary randomly over time.	$Y_{ij} = \left[Y_{00} + Y_{10}TIME_{ij} + Y_{20}CARE_{ij}\right] + \left[\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varsigma_{2i}CARE_{ij} + \varepsilon_{ij}\right]$
Model C	Change in elevation, not slope. No random variations for care over time.	$Y_{ij} = \left[Y_{00} + Y_{10}TIME_{ij} + Y_{20}CARE_{ij}\right] + \left[\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varepsilon_{ij}\right]$

Model D	Change in slope, not elevation. Allowing care to vary randomly over time.	$Y_{ij} = [Y_{00} + Y_{10}TIME_{ij} + Y_{20}(CARE_{ij} \times TIME_{ij})] + [\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varsigma_{2i}CARE_{ij} \times TIME_{ij} + \varepsilon_{ij}]$
Model E	Change in slope, not elevation. No random variations for care over time.	$Y_{ij} = [Y_{00} + Y_{10}TIME_{ij} + Y_{20}(CARE_{ij} \times TIME_{ij})] + [\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varepsilon_{ij}]$
Model F	Changes in elevation and slope. Allowing care and care by time to vary randomly over time.	$Y_{ij} = [Y_{00} + Y_{10}TIME_{ij} + Y_{20}CARE_{ij} + Y_{30}(CARE_{ij} \times TIME_{ij})] + [\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varsigma_{2i}CARE_{ij} + \varsigma_{3i}CARE_{ij} \times TIME_{ij} + \varepsilon_{ij}]$
Model G	Changes in elevation and slope. Allowing care by time to vary randomly over time. No random variations for care over time.	$Y_{ij} = [Y_{00} + Y_{10}TIME_{ij} + Y_{20}CARE_{ij} + Y_{30}(CARE_{ij} \times TIME_{ij})] + [\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varsigma_{3i}CARE_{ij} \times TIME_{ij} + \varepsilon_{ij}]$
Model H	Changes in elevation and slope. Allowing care to vary randomly over time. No variations for care by time over time.	$Y_{ij} = [Y_{00} + Y_{10}TIME_{ij} + Y_{20}CARE_{ij} + Y_{30}(CARE_{ij} \times TIME_{ij})] + [\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varsigma_{2i}CARE_{ij} + \varepsilon_{ij}]$
Model I	Changes in elevation and slope. No random variations for care or care by time over time.	$Y_{ij} = [Y_{00} + Y_{10}TIME_{ij} + Y_{20}CARE_{ij} + Y_{30}(CARE_{ij} \times TIME_{ij})] + [\varsigma_{0i} + \varsigma_{1i}TIME_{ij} + \varepsilon_{ij}]$

Variables in the multilevel models

The independent and dependent variables in the multilevel analysis take the opposite pattern to those in the event-history analysis. This means that the independent (or predictive) variables being assessed are now caring responsibilities, and the dependent variables (on which the impacts of care are being measured) are the series of demographic, economic, health and wellbeing and life satisfaction variables.

The variables on which the impact of caring responsibilities are measured are numerous. They fit into four distinct categories of demographic, economic, health and wellbeing and life satisfaction. Some, but certainly not all, of these variables are also included as predictive variables in the previous event-history analysis. This is because conceptually, some of the variables in question can either predict the hazard of providing care *or* can be impacted by the provision of care. It is also possible that some variables will have both predictive power for the provision of care, *as well as* being impacted by the provision of care.

Only one demographic variable is included in the multilevel level analysis, as conceptually, it is not possible for the provision of care to impact most of the demographic variables (for example; age, sex, or country of birth cannot logically change due to caring responsibilities). The remaining demographic variable to be included here is relationship status. Relationship status is included as a dichotomous variable with those living with a partner coded as 1 and those not living with a partner coded as the reference group (0).

Two economic variables are incorporated in the multilevel models; these are labour force participation and income. Employment status is constructed as a dichotomous variable with those who are in the labour force and those who are not. Income is recoded into quintiles for ease of interpretation, but is still treated as a continuous variable. It measures respondents' total disposable income.

The effects of caring responsibilities are also measured on a large number of health and wellbeing indicators. These are a series of self-reported measures found in the Self Completion Questionnaire (SCQ) section of the HIDLA survey. They include; general health and wellbeing, vitality, physical functioning, bodily pain, mental health, social functioning, emotional health, and psychological distress. Excepting psychological distress, all those variables are continuous variables on a scale of zero to ten. Psychological distress is a continuous variable on a scale of zero to 100 (with 100 being the highest level of psychological distress). This variable was constructed by HILDA researchers using a range of questions from the Kessler psychological distress scale.

Finally, the multilevel models include a series of variables on respondents' life satisfaction in a number of areas. All the life satisfaction measures are continuous on a scale of zero to ten, with ten being the most satisfied. The life satisfaction variables include: general life satisfaction, satisfaction with free time, satisfaction with health, satisfaction with employment opportunities, satisfaction with the home lived in, satisfaction with the financial situation, satisfaction with feeling safe, satisfaction with feeling part of the local community, and satisfaction with the neighbourhood lived in.

It is also important to clarify that while caring responsibilities are the predictive variables of interest in this chapter, a number of the dependent variables outlined above are also included as independent variables in each model. This is to ensure that the impacts of other variables outside of just caring responsibilities are controlled for. For example, employment status is likely impacted by many different factors, such as sex, age, relationship status or education level. Including as many other relevant variables as possible helps to ensure that their impacts on employment status are not incorrectly attributed to caring responsibilities. The variables included do differ slightly for each model, but the presentation of the results of each model will specify

which control variables have been included. The additional variables included as independent variables in the multilevel models are sex, age, type of area lived in, English proficiency, country of birth, and education levels. The effects of many of the non-caring predictive variables are also allowed to vary over time. This means that interaction terms for each of the other independent variables are also included in many of the models. These additional interaction terms are constructed by multiplying the variables by time.

Results

The many ways in which caring responsibilities impact on the lives of those providing care are demonstrated in the following presentation of the results of the multilevel models. The examination of these results begins with Table 7.2, illustrating the effect that each type of caring responsibility has on each dependent variable. Unlike the results of the event-history analysis, whose results were presented as odds ratios, the results of the multilevel models are presented as coefficients. This means that each result indicates a change of that amount in the dependent variable for each unit change in the predictive variable (caring responsibility). Each row in the table below represents a separate model. Only the statistically significant results for caring responsibilities are included in Table 7.2, however each model is presented and examined in detail separately over the remainder of this chapter.

Table 7.2 Multilevel models results, impact of caring responsibilities

	Dual Care		Informal Care		Child Care	
	Elevation	Slope	Elevation	Slope	Elevation	Slope
Relationship status	0.20	-0.01	0.05		0.20	-0.01
Employment status	-0.12	0.01			-0.10	0.01
General health and well-being		-0.23		-0.12		0.07
Vitality	-4.10		-1.03		-2.55	
Social functioning	-2.07		-2.07			0.13
Emotional health	-2.11		-1.06			
Mental health			-1.12			
Psychological distress		0.26				
General life satisfaction		-0.03	-0.08		-0.06	-0.01
Satisfaction with free time	-1.13		-0.42		-0.84	
Satisfaction with your health		-0.34			-0.08	
Satisfaction with employment opportunities						-0.02
Satisfaction with the home you live in	-0.36				-0.31	
Satisfaction with your financial situation	-0.40		-0.13		-0.18	-0.01
Satisfaction with how safe you feel		-0.03			-0.18	
Satisfaction with feeling part of your local community						0.01
Satisfaction with the neighbourhood you live in					-0.07	

All results significant at $p<0.05$
Source: HILDA, 2005-2013
The scale for each variable is as follows. Relationship status and employment status: 0-1. Health and wellbeing variables: 0-100. Life satisfaction variables: 0-10.

As a general observation of the aggregated results of the multilevel models, it is clear that all types of caring responsibilities impact a wide range of variables.

It is also evident that the effects of dual caring are frequently of a greater magnitude than the effects of other caring responsibilities.

Relationship status

The first variable examined in the multilevel models is relationship status. Table 7.3 presents the results of the model illustrating the impacts of caring responsibilities on living with a partner. For the examination of the impacts of care on relationship status, Model F provides the best fit. This means that the model allows for discontinuities in both elevation and slope, whilst allowing for the magnitude of care and care by time to vary over time. The comparison of deviance scores justifying this decision can be viewed in table x in the appendix.

Table 7.3 Multilevel model results for relationship status, coefficients

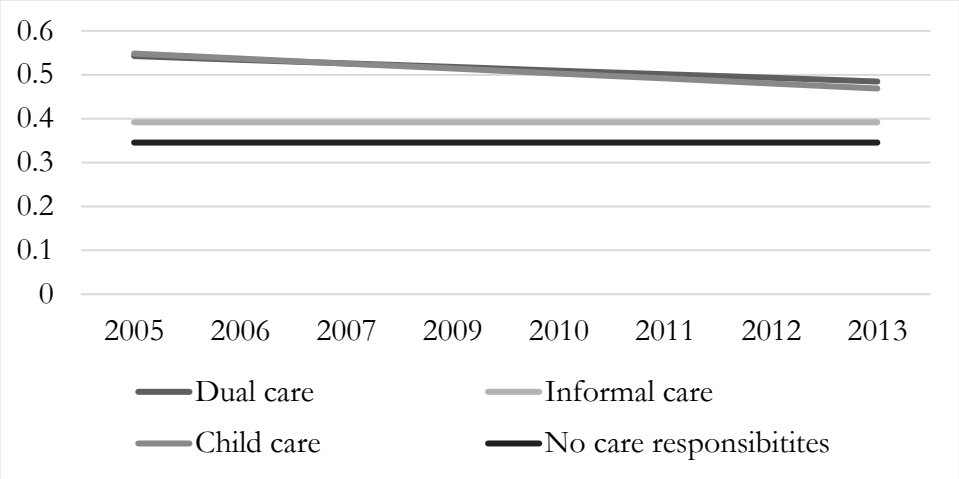
Dual care responsibility	0.197	**
Informal care responsibility	0.046	**
Child care responsibility	0.203	**
Dual care responsibility by time	-0.008	**
Informal care responsibility by time	-0.002	
Child care responsibility by time	-0.011	**
Time (year of survey)	-0.002	
Female (ref male)	-0.036	**
Age	0.005	**
Employed part-time	-0.011	
Unemployed	-0.019	
Out of the labour force	0.006	
Lives in regional area	0.018	**
Lives in remote area	0.065	**
Born in Australia	-0.085	**
Aboriginal or Torres Strait Islander	-0.055	*
Has Year 12 certificate	-0.010	
Has Bachelor's degree or higher	0.102	**
Has certificate or diploma	0.060	**
Income quintiles	0.000	
Employed part-time by time	-0.003	**
Unemployed by time	-0.002	
Out of the labour force by time	-0.009	**
Lives in regional area by time	-0.001	
Lives in remote area by time	-0.007	**
Born in Australia by time	0.005	**
Aboriginal or Torres Strait Islander by time	0.009	
Has Year 12 certificate by time	0.009	**
Has Bachelor's degree or higher by time	0.008	**
Has certificate or diploma by time	0.006	**
Income quintiles by time	0.000	
Constant	0.346	**

**significant at p<0.01, *significant at p<0.05
Source: HILDA 2005-2013

The predictive variables of interest here are of course, caring responsibilities. All caring responsibilities have an immediate impact on the likelihood of living with a partner, and that impact is positive for dual care, informal care and

child care. In addition to being more likely to be living with a partner on taking on caring responsibilities, dual care and child care appear to cause a reduction in living with a partner that increases as time spent caring goes on. In other words, there is an increase in elevation for all types of care on beginning to provide care, but a decrease in slope for dual and child care on the likelihood of living with a partner. This relationship is illustrated in Figure 7.1. It should be noted that the results for dual care and child care follow similar trajectories, resulting in the dual care line being somewhat hidden by the line representing child care.

Figure 7.1 Impact of caring responsibilities on relationship status



Source: HILDA, 2005-2013

The growing reduction in living with a partner as time spent providing dual or child care continues indicates that there could be increased pressures on relationships associated with parenting and providing dual care, that are not present in the provision of informal care alone, or for those with no caring responsibilities.

Economic status

Labour force participation

Just as labour force participation was found in the previous chapter to be a significant predictor of dual care, and other caring responsibilities, the results of the multilevel model analysis show that labour force participation is also *impacted by* the provision of care. Again, Model F provides the best fit for assessing the impacts of caring on employment status, which allows for discontinuities in elevation and slope, whilst allowing care and care by time to vary randomly over time. Table 7.4 presents the results of that model.

Table 7.4 Multilevel model results for labour force participation, coefficients

Dual care responsibility	-0.122	**
Informal care responsibility	-0.011	
Child care responsibility	-0.103	**
Dual care responsibility by time	0.013	**
Informal care responsibility by time	-0.002	
Child care responsibility by time	0.013	**
Time (year of survey)	0.007	**
Female (ref male)	-0.083	**
Age	-0.009	**
Lives with a partner	0.076	**
Lives in regional area	0.005	
Lives in remote area	0.081	**
Speaks English well	-0.069	**
Born in Australia	0.044	**
Aboriginal or Torres Strait Islander	-0.044	
Has Year 12 certificate	0.218	**
Has Bachelor's degree or higher	0.330	**
Has certificate or diploma	0.261	**
Female by time	-0.002	*
Lives with a partner by time	-0.007	**
Lives in regional area by time	-0.003	**
Lives in remote area by time	-0.003	
Speaks English well by time	-0.005	
Born in Australia by time	-0.001	
Aboriginal or Torres Strait Islander by time	-0.004	
Has Year 12 certificate by time	0.002	
Has Bachelor's degree or higher by time	-0.003	**
Has certificate or diploma by time	-0.005	**
Constant	0.957	**

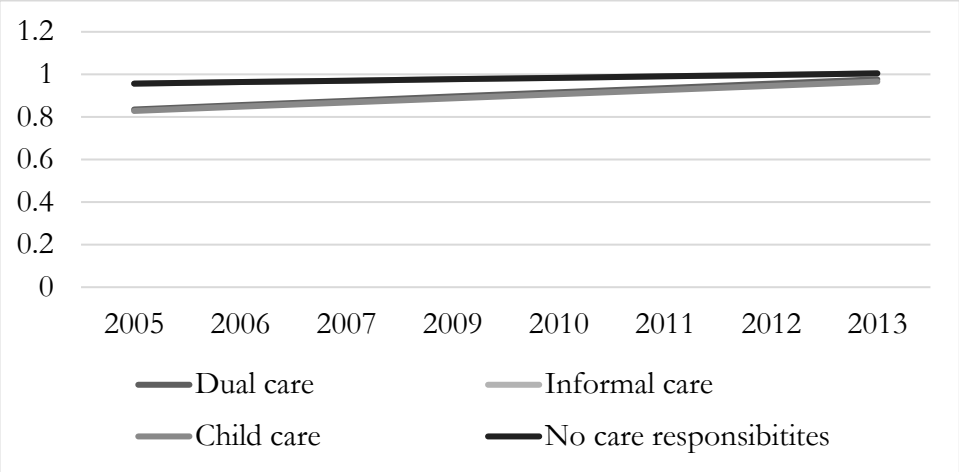
**significant at $p<0.01$, *significant at $p<0.05$

Source: HILDA, 2005-2013

Looking at the caring responsibilities in Table 7.4, we can see that the provision of informal care does not have any significant impacts on labour force participation. Dual care and child care, once again have similar impacts.

Initially, both significantly reduce the chances of being in the labour force, but over time they slightly increase labour force participation. These impacts are illustrated in Figure 7.2. Once again, dual care and child care follow similar trajectories, as do informal care and no caring responsibilities. As a result of these similarities, the lines representing informal care and child care are hidden underneath no care responsibilities and dual care, respectively.

Figure 7.2 Impact of caring responsibilities on labour force participation



Source: HILDA, 2005-2013

The initial lowering of employment status on commencing dual care or child care is in line with the previous literature and theories of role overload. These theories postulated that the pressures on dual and child carers could push them out of the workforce. The slight increase in labour force participation over time for these two groups was unexpected, but could potentially be explained by the initial 'blow' of introducing caring responsibilities causing people to leave the workforce immediately, followed by a slow re-entry employment as they adjust to caring responsibilities, or as children age. This analysis was also repeated using employment status (employed and unemployed) as the dependent variable. This model produced almost identical

results to labour force participation model. Those results are available in Appendix 2.

Income

The other economic measure included in the multilevel models is income. The model which provided the best fit for this variable was Model H, which allowed for changes in both elevation and slope, but only allowed care (and not care by time) to vary randomly. The full results of this model are presented in Table 7.5.

Table 7.5 Multilevel model results for income (quintiles), coefficients

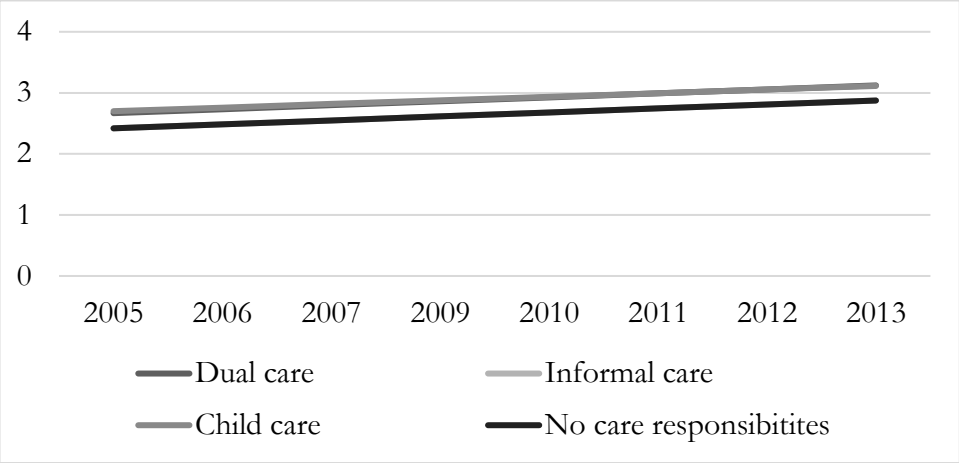
Dual care responsibility	0.248	**
Informal care responsibility	-0.004	
Child care responsibility	0.281	**
Dual care responsibility by time	0.002	
Informal care responsibility by time	0.000	
Child care responsibility by time	-0.006	*
Time (year of survey)	0.065	**
Female (ref male)	-0.346	**
Age	0.015	**
Lives with a partner	0.103	**
Employed part-time	-0.539	**
Unemployed	-0.539	**
Out of the labour force	-0.859	**
Lives in regional area	-0.125	**
Lives in remote area	-0.064	
Speaks English well	-0.354	**
Born in Australia	0.114	**
Aboriginal or Torres Strait Islander	-0.071	
Has Year 12 certificate	0.158	**
Has Bachelor's degree or higher	0.957	**
Has certificate or diploma	0.564	**
Female by time	0.008	**
Lives with a partner by time	0.007	**
Employed part-time by time	-0.031	**
Unemployed by time	-0.057	**
Out of the labour force by time	-0.056	**
Lives in regional area by time	0.008	**
Lives in remote area by time	0.021	**
Speaks English well by time	0.014	
Born in Australia by time	0.012	**
Aboriginal or Torres Strait Islander by time	-0.018	
Has Year 12 certificate by time	0.020	**
Has Bachelor's degree or higher by time	-0.013	**
Has certificate or diploma by time	-0.008	*
Constant	2.419	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

As was the case for labour force participation, the provision of informal care does not exhibit any significant impacts on income. Dual care and child care, however, both show positive impacts on the elevation of income, with scores of 0.248 and 0.281 respectively. The provision of child care also has a small but statistically significant, negative slope in this model. These impacts of caring responsibilities on income are illustrated in Figure 7.3.

Figure 7.3 Impact of caring responsibilities on income (by quintiles)



Source: HILDA, 2005-2013

The increased elevation in income for dual carers and child carers is evident, but the very slight reduction in slope for child carers is hidden by the larger significant increase of time. Additionally, the line for child care is hidden by the line for dual care, and informal care is underneath the line for those with no care responsibilities. What the results of Table 7.5 and Figure 7.3 mean is that when Australians begin providing dual and child care, they experience an initial boost to their incomes, but as child care continues over time, income reduces slightly. Informal carers and those with no caring responsibilities are not statistically significantly different from one another. These were somewhat surprising findings, given what has been indicated in previous research. One possible explanation for the initial positive impact of dual and child care is that those on lower incomes leave employment when they commence

providing care, leaving dual and child carers with higher incomes (or with jobs with the potential for increasing income) and creating an artificial boost to income on taking up those caring responsibilities in the model.

Physical health

The impacts of caring responsibilities on physical health were assessed using four variables with the multilevel models. These variables were general health and wellbeing, vitality, physical functioning and bodily pain. The reporting of these results begins with the model for general health and wellbeing.

General health and wellbeing

The first measure assessing the impact of caring responsibilities on physical health is general health and wellbeing, the analysis of this variable offers strong support for the idea that the provision of care can produce negative impacts on the health of carers. The model which best explains the variance in general health and wellbeing is Model D, which includes changes in slope but not elevation for caring responsibilities, and allows care by time to vary randomly over time. The results of that model are presented in Table 7.6.

Table 7.6 Multilevel model results for general health, coefficients

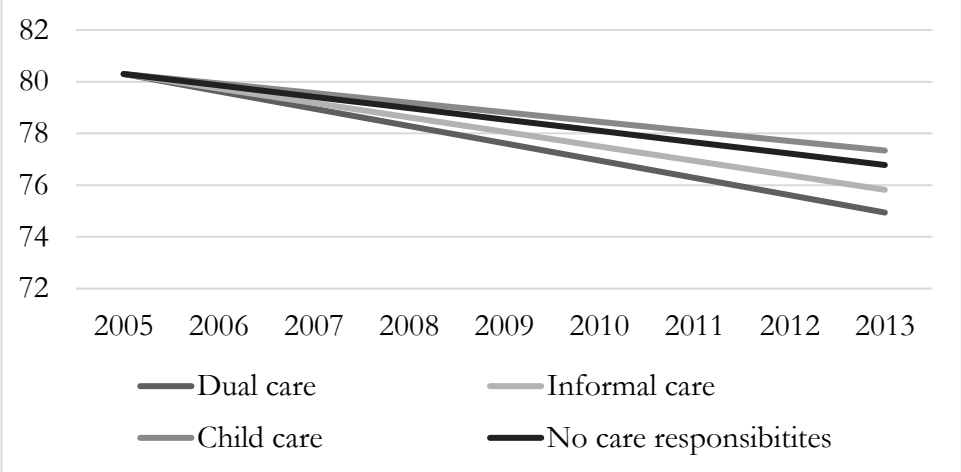
Dual care responsibility by time	-0.227	**
Informal care responsibility by time	-0.120	**
Child care responsibility by time	0.069	*
Time (year of survey)	-0.435	**
Female	-0.920	**
Age	-0.229	
Living with partner	0.693	**
Employed part-time	-0.360	**
Unemployed	-1.396	
Out of the labour force	-1.723	
Lives in regional area	-0.169	**
Lives in remote area	0.141	
Speaks English well	-4.312	
Born in Australia	-0.528	
Aboriginal or Torres Strait Islander	1.424	**
Has finished Year 12	-0.068	
Has Bachelor's degree or higher	2.990	
Has certificate or diploma	0.203	**
Income	0.000	
Female by time	0.191	*
Living with partner by time	-0.013	
Employed part-time by time	-0.099	**
Unemployed by time	0.044	
Out of the labour force by time	-0.191	
Lives in regional area by time	0.046	
Lived in remote area by time	0.091	
Speaks English well by time	0.361	
Born in Australia by time	-0.077	
Aboriginal or Torres Strait Islander by time	-0.314	
Has finished Year 12 by time	0.097	
Has Bachelor's degree or higher by time	0.041	*
Has certificate or diploma by time	0.032	
Constant	80.288	**

**significant at $p<0.01$, *significant at $p<0.05$

Source: HILDA, 2005-2013

Due to Model D being the best fit model, we can assume that on picking up caring responsibilities, none of the three groups experience any statistically significant immediate changes in their general health. Indeed, Model D does not allow for changes in elevation on becoming a dual carer, informal carer or child carer. However, the model does allow for changes that intensify or weaken over time, and all three caring responsibilities demonstrate changes in their reported general health and wellbeing that intensify over time. This change is the most intense and negative for dual carers, who have a slope of -0.227. Informal carers also experience an intensification of poor health, with a negative slope of -0.120. Child carers, on the other exhibit increasingly positive general health and wellbeing as time goes on. The slope for those with child care responsibilities is positive, at 0.069. The changes in general health and wellbeing due to changing caring responsibilities are illustrated in Figure 7.4.

Figure 7.4 Impact of caring responsibilities on general health and wellbeing



Source: HILDA, 2005-2013

Due to the significant negative impact of time itself on general health and wellbeing, the positive slope for child carers is somewhat hidden. However, it is evident that the decline in general health and wellbeing over time for child

carers is not as steep as it is for dual carers, informal carers and even those with no caring responsibilities. The key finding that Figure 7.4 demonstrates is that over time, providing dual care significantly worsens general health and wellbeing, more so than any other type of caring responsibility. This finding offers support for the theory of role overload, it seems plausible that the increased pressures of providing two types of care has impacted negatively on general health and wellbeing.

Vitality

Support for the negative impacts of role overload on dual carers is also found in the analysis assessing the effects of caring on vitality. Once again, Model F provided the best fit for explaining the variance in reported vitality of HILDA respondents. The results of this model are presented in Table 7.7.

Table 7.7 Multilevel model results for vitality, coefficients

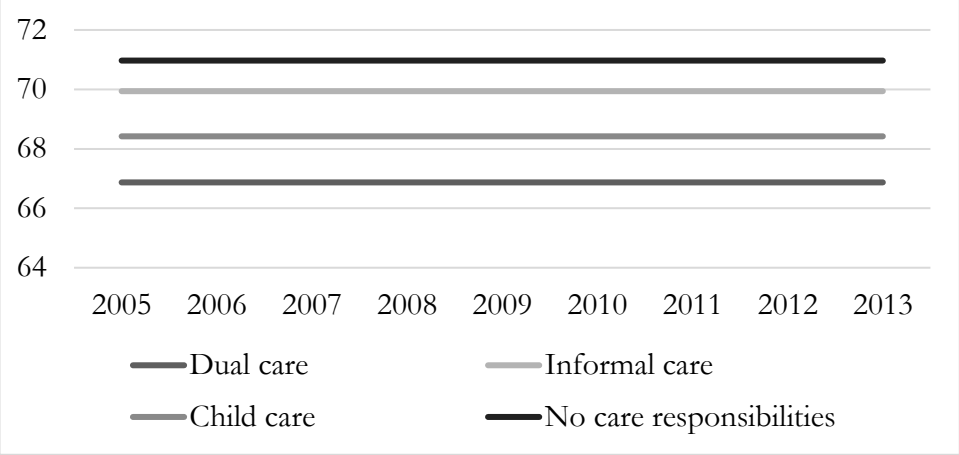
Dual care responsibility	-4.103	**
Informal care responsibility	-1.032	**
Child care responsibility	-2.545	**
Dual care responsibility by time	0.065	
Informal care responsibility by time	0.030	
Child care responsibility by time	0.079	
Time (year of survey)	-0.034	
Female	-4.015	**
Age	-0.079	**
Living with partner	0.545	*
Employed part-time	1.097	**
Unemployed	2.309	**
Out of the labour force	-0.124	
Lives in regional area	-0.039	
Lives in remote area	0.723	
Speaks English well	-3.361	**
Born in Australia	-1.177	**
Aboriginal or Torres Strait Islander	1.171	
Has finished Year 12	-0.285	
Has Bachelor's degree or higher	1.130	**
Has certificate or diploma	-0.351	
Income	0.000	
Female by time	0.013	
Living with partner by time	0.003	
Employed part-time by time	-0.142	**
Unemployed by time	-0.256	**
Out of the labour force by time	-0.225	**
Lives in regional area by time	0.049	
Lived in remote area by time	-0.004	
Speaks English well by time	0.468	*
Born in Australia by time	-0.125	*
Aboriginal or Torres Strait Islander by time	-0.010	
Has finished Year 12 by time	0.030	
Has Bachelor's degree or higher by time	0.030	
Has certificate or diploma by time	0.036	
Income by time	0.000	
Constant	70.968	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

Inspection of Table 7.7 clearly shows that all three types of care demonstrate an immediate reduction in vitality on picking up their caring responsibilities. Once again, the negative impact is largest for dual carers. Dual carers experience an immediate reduction of -.4.103 on becoming dual carers, informal carers have a reduction of -1.032 and the vitality of child carers reduces by -2.545 on beginning their caring responsibilities. Though there is a strong initial negative impact of all types of caring responsibilities (a reduction in elevation), these impacts do not intensify or weaken over time (the slope remains the same for all). The impact of caring responsibilities on vitality are illustrated visually in Figure 7.5.

Figure 7.5 Impact of caring responsibilties on vitality



Source: HILDA, 2005-2013

Coupled with the model for general health and wellbeing, the multilevel model for vitality lends strong support to the theories raised in the literature review. Specifically, it further confirms the ideas of role overload, which suggest that increased caring responsibilities would cause strain and stress, resulting in negative impacts on health.

Physical functioning

The examination of the previous physical health indicators demonstrates that dual caring has significantly negative impacts on reported physical health. Conversely, the following two variables; physical functioning and bodily pain do not provide any additional evidence to support those findings. Model F again proves to be the best fit model for the examination of physical functioning. The results presented in Table 7.8 show that neither informal care nor dual care produce a statistically significant impact on physical functioning.

Table 7.8 Multilevel model results for physical functioning, coefficients

Dual care responsibility	0.853	
Informal care responsibility	-0.350	
Child care responsibility	0.998	**
Dual care responsibility by time	0.150	
Informal care responsibility by time	-0.043	
Child care responsibility by time	0.143	**
Time (year of survey)	0.150	
Female	-1.100	**
Age	-0.472	**
Living with partner	1.355	**
Employed part-time	-0.761	**
Unemployed	-2.448	**
Out of the labour force	-3.759	**
Lives in regional area	0.035	
Lives in remote area	1.048	
Speaks English well	-5.938	**
Born in Australia	0.237	
Aboriginal or Torres Strait Islander	-0.231	
Has finished Year 12	2.500	**
Has Bachelor's degree or higher	6.073	**
Has certificate or diploma	3.146	**
Income	0.001	**
Female by time	-0.090	*
Living with partner by time	-0.008	
Employed part-time by time	-0.128	*
Unemployed by time	-0.074	
Out of the labour force by time	-0.305	**
Lives in regional area by time	-0.014	
Lived in remote area by time	-0.224	
Speaks English well by time	0.744	**
Born in Australia by time	0.042	
Aboriginal or Torres Strait Islander by time	-0.836	*
Has finished Year 12 by time	0.103	
Has Bachelor's degree or higher by time	0.034	
Has certificate or diploma by time	-0.061	
Income by time	0.000	
Constant	102.468	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

The provision of child care, on the other hand, does exhibit a statistically significant effect on physical functioning. Providing child care actually increases physical functioning, both immediately and over time. Because child care is the only caring responsibility to produce a significant impact on reported physical functioning, there is no need for a figure illustrating the differences between the effects of the different caring responsibilities.

Bodily pain

Similar to the model for physical functioning, the model providing the best fit for the examination of bodily pain is Model F. This model suggests that there are no statistically significant impacts of any of the caring responsibilities on bodily pain. The results of the model for bodily pain are nonetheless presented in Table 7.9.

Table 7.9 Multilevel model results for bodily pain, coefficients

Dual care responsibility	0.418	
Informal care responsibility	-0.697	
Child care responsibility	0.496	
Dual care responsibility by time	-0.261	
Informal care responsibility by time	-0.013	
Child care responsibility by time	0.066	
Time (year of survey)	0.059	
Female	-1.720	**
Age	-0.339	**
Living with partner	0.278	
Employed part-time	-0.376	
Unemployed	-0.593	
Out of the labour force	-3.237	**
Lives in regional area	-1.305	**
Lives in remote area	0.321	
Speaks English well	-5.461	**
Born in Australia	-0.006	
Aboriginal or Torres Strait Islander	0.588	
Has finished Year 12	1.270	**
Has Bachelor's degree or higher	3.667	**
Has certificate or diploma	-0.223	
Income	0.001	**
Female by time	-0.059	
Living with partner by time	-0.090	
Employed part-time by time	-0.075	
Unemployed by time	-0.047	
Out of the labour force by time	-0.118	*
Lives in regional area by time	0.100	*
Lived in remote area by time	-0.135	
Speaks English well by time	0.646	
Born in Australia by time	-0.105	
Aboriginal or Torres Strait Islander by time	-0.554	
Has finished Year 12 by time	0.088	
Has Bachelor's degree or higher by time	0.054	
Has certificate or diploma by time	0.082	
Constant	91.333	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

As was the case for physical functioning, due to the lack of statistically significant relationships between caring and bodily pain, the results of this model are not visually represented in a figure. The findings of this model and the previous model suggest that the provision of care does not have any effect on the level of physical functioning or bodily pain experienced by respondents (with the exception of child care increasing physical functioning). This does not detract from the earlier finding that caring in general, and dual caring in particular has significantly negative impacts on carers' physical health. Rather, it suggests that this is an *area within* physical health that is generally not effected by caring. Physical functioning and bodily pain could in fact be proxies for another phenomenon or characteristics (for example disability) that are not related to the provision of care in general or dual care specifically. In addition to impacting on physical health, the following analyses show that caring has significant adverse impacts on mental health as well.

Mental health

Four multilevel models assess the impact of changing caring responsibilities on mental health. The variables investigated are mental health, emotional health, social functioning and psychological distress. The discussion of the results of these analyses show that caring responsibilities in general, and dual care in particular have significant negative impacts on the self-reported mental health of Australians.

Mental health

The first model assessing mental health finds support for the idea of role-overload theory, demonstrating reductions in mental health for both dual and informal carers. The model which provides the best fit for this analysis is Model B, which allows for changes in elevation, but not slope. The results of this model are displayed in Table 7.10.

Table 7.10 Multilevel model results for mental health, coefficients

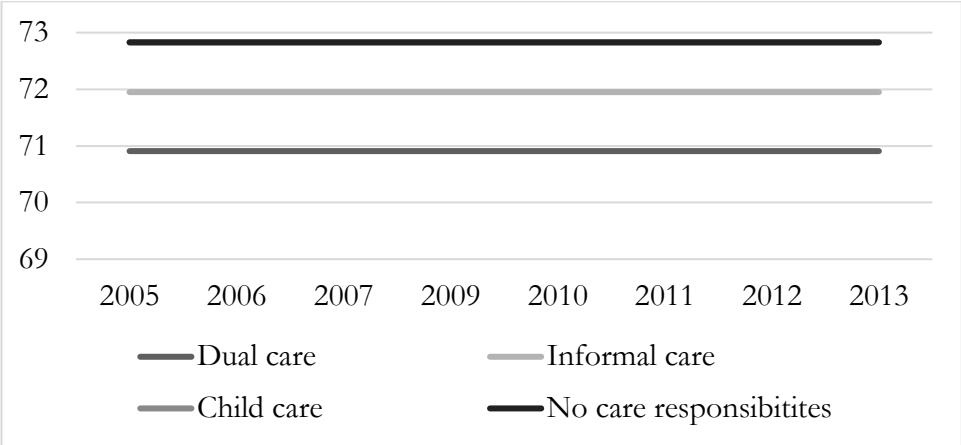
Dual care responsibility	-1.920	**
Informal care responsibility	-0.878	**
Child care responsibility	-0.004	
Time (year of survey)	-0.108	
Female	-2.603	**
Age	0.065	**
Living with partner	2.111	**
Employed part-time	-0.134	
Unemployed	-2.188	**
Out of the labour force	-1.675	**
Lives in regional area	0.357	
Lives in remote area	1.840	**
Speaks English well	-3.383	**
Born in Australia	1.821	**
Aboriginal or Torres Strait Islander	0.703	
Has finished Year 12	0.718	*
Has Bachelor's degree or higher	1.309	**
Has certificate or diploma	-0.210	
Income	0.000	
Female by time	0.100	**
Living with partner by time	-0.041	
Employed part-time by time	-0.081	
Unemployed by time	-0.035	
Out of the labour force by time	-0.083	*
Lives in regional area by time	0.047	
Lived in remote area by time	-0.050	
Speaks English well by time	0.232	
Born in Australia by time	-0.154	**
Aboriginal or Torres Strait Islander by time	-0.119	
Has finished Year 12 by time	-0.074	
Has Bachelor's degree or higher by time	0.047	
Has certificate or diploma by time	0.056	*
Income by time	0.000	*
Constant	72.828	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

The first three rows of Table 7.10 clearly illustrate the adverse impacts of caring on mental health. Firstly, the provision of dual care causes an immediate reduction in mental health, specifically, a drop of -1.920. Taking on an informal caring responsibility also causes a reduction in mental health, though slightly smaller than the reduction experienced by dual carers, at -0.878. There is no significant impact of providing child care found by the model. As such, child carers and those with no caring responsibilities are indiscernible from one another in the visual presentation of the impact of caring responsibilities in Figure 7.6.

Figure 7.6 Impact of caring responsibilities on mental health



Source: HILDA, 2005-2013

Figure 7.6. illustrates the immediate drop in elevation of mental health for dual carers and informal carers when they begin providing care. As the model used for the analysis (Model B) does not allow for changes in slope, the impacts on mental health do not intensify nor improve over time. The reduction in reported mental health for dual carers and informal carers lends more support to the role overload theories explored in the literature review.

Emotional health

The multilevel model for emotional health also confirms the idea that the provision of additional caring roles can negatively impact mental health. As was the case for mental health, the model providing the best fit for emotional health is Model B, allowing for a change in elevation, but holding the effects of caring over time (the slope) stable. The results of this analysis are described in the following table, Table 7.11.

Table 7.11 Multilevel model results for emotional health, coefficients

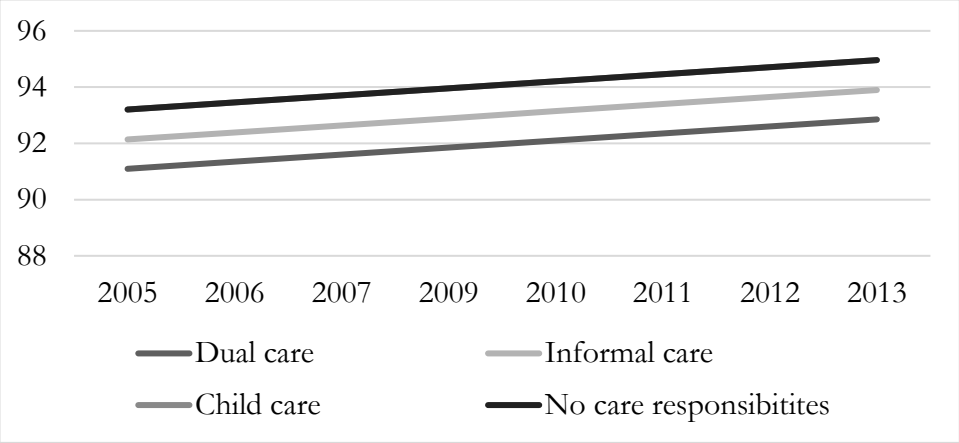
Dual care responsibility	-2.108	**
Informal care responsibility	-1.064	**
Child care responsibility	0.361	
Time (year of survey)	0.251	*
Female	-1.264	**
Age	-0.035	**
Living with partner	2.860	**
Employed part-time	-0.670	*
Unemployed	-1.892	**
Out of the labour force	-2.352	**
Lives in regional area	-0.370	
Lives in remote area	0.545	
Speaks English well	-1.643	
Born in Australia	0.559	
Aboriginal or Torres Strait Islander	-3.326	
Has finished Year 12	0.346	
Has Bachelor's degree or higher	0.327	
Has certificate or diploma	-0.418	
Income	0.000	*
Female by time	-0.023	
Living with partner by time	-0.090	
Employed part-time by time	-0.068	
Unemployed by time	-0.073	
Out of the labour force by time	-0.064	
Lives in regional area by time	0.098	*
Lived in remote area by time	0.237	
Speaks English well by time	0.366	
Born in Australia by time	-0.140	*
Aboriginal or Torres Strait Islander by time	0.320	
Has finished Year 12 by time	-0.109	
Has Bachelor's degree or higher by time	0.054	
Has certificate or diploma by time	-0.029	
Income by time	0.000	
Constant	93.203	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

The results in the table demonstrate that on taking up their caring responsibilities, dual cares experience a reduction in emotional health of -2.108. This is double the reduction seen in informal carers, whose emotional health decreases by -1.064 when they begin providing care. In addition to these reductions in emotional health for dual and informal carers, we can see that there is no statistically significant relationship between the provision of child care and emotional health. The relationship between the provision of care and emotional health uncovered in the multilevel model is represented visually in Figure 7.7.

Figure 7.7 Impact of caring responsibilities on emotional health



Source: HILDA, 2005-2013

The figure shows that those with child care responsibilities are not discernible from those with no caring responsibilities in terms of emotional health, which is why the line representing child care is not visible. Dual carers are the lowest line in the figure, illustrating that they experience the largest immediate reduction in emotional health. Although the model used for this variable does not allow for the effects of changes in caring responsibilities to vary over time, time itself was a positive predictor of emotional health. It is this statistically significant increase in emotional health for all Australians that is responsible for the positive slope seen for all caring responsibilities in Figure 7.7. As

mentioned previously, Model B does not allow for changes in slope based on caring responsibility. Overall, the model for emotional health offers additional support for the role overload theory of the impacts of informal and dual care.

Social functioning

The model for social function exhibits a similar pattern as the two previous models dealing with mental health. Model F provides the best fit for the examination of social functioning. This means that in the results presented, the effects of care are allowed discontinuities in both elevation and slope, and both care and care by time were allowed to vary randomly over time. The findings of this model are presented in Table 7.12.

Table 7.12 Multilevel model results for social functioning, coefficients

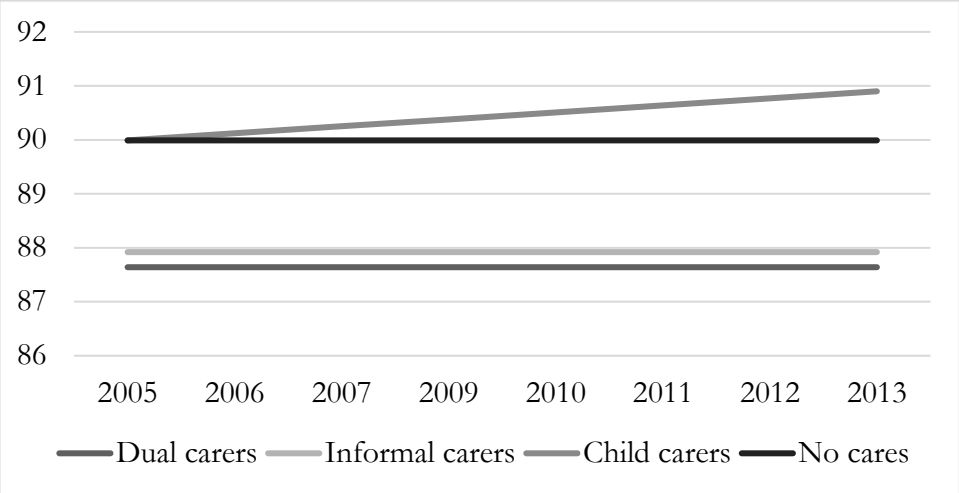
Dual care responsibility	-2.354	*
Informal care responsibility	-2.067	**
Child care responsibility	-0.076	
Dual care responsibility by time	0.001	
Informal care responsibility by time	0.075	
Child care responsibility by time	0.129	*
Time (year of survey)	0.033	
Female	-2.947	**
Age	-0.126	**
Living with partner	3.833	**
Employed part-time	-0.552	
Unemployed	-2.990	**
Out of the labour force	-4.149	**
Lives in regional area	-0.493	
Lives in remote area	0.831	
Speaks English well	-5.306	**
Born in Australia	1.704	**
Aboriginal or Torres Strait Islander	-2.464	
Has finished Year 12	1.149	**
Has Bachelor's degree or higher	1.947	**
Has certificate or diploma	-0.811	
Income	0.001	**
Female by time	0.069	
Living with partner by time	-0.125	*
Employed part-time by time	-0.065	
Unemployed by time	-0.111	
Out of the labour force by time	-0.278	**
Lives in regional area by time	0.103	*
Lived in remote area by time	-0.057	
Speaks English well by time	0.520	*
Born in Australia by time	-0.143	*
Aboriginal or Torres Strait Islander by time	-0.281	
Has finished Year 12 by time	-0.116	
Has Bachelor's degree or higher by time	0.067	
Has certificate or diploma by time	0.077	
Income by time	0.000	
Constant	89.992	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

Once again, dual carers exhibit the most serious negative impacts on beginning their caring responsibilities, with a change in elevation of -2.354. Informal carers also experience a slightly smaller reduction in social functioning when they begin providing care, with a score of -2.067. On taking up child care responsibilities, Australians who provide child care are no different than the non-caring population. However, over time, those who provide child care actually demonstrate an increase in social functioning of 0.129. These patterns are illustrated in Figure 7.8.

Figure 7.8 Impact of caring status on social functioning



Source: HILDA, 2005-2013

Evidently, the provision of informal and dual care both have an immediate, negative effect on social functioning. Child care has no immediate impact, but as time goes on, those who provide child care report increasing social functioning, to the point that their reported social functioning is better than those who do not provide any care. The findings of this model continue to confirm the association between increased caring responsibilities and decreased mental health.

Psychological distress

The final measure assessing the impacts of caring responsibilities on mental health is psychological distress. As was the case for all other measures dealing with mental health, the model for psychological distress suggests that the provision of dual care is associated with significant reductions in mental health. The model which provides the best fit for psychological distress is Model G. Model G allows the changes in caring responsibilities to impact on both the elevation and slope of psychological distress. It also allows care (but not care by time) to vary randomly. The results of this model assessing the impacts of care on psychological distress are presented in Table 7.13.

Table 7.13 Multilevel model results for psychological distress, coefficients

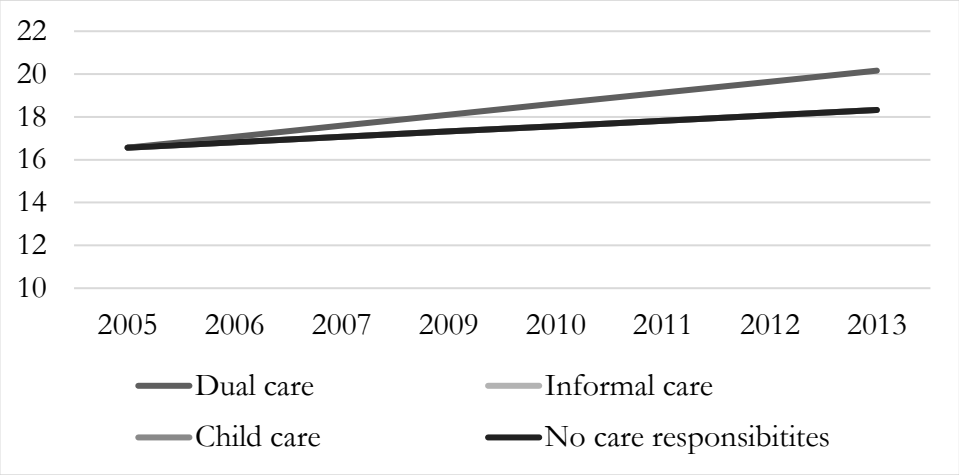
Dual care responsibility	0.066	
Informal care responsibility	0.443	
Child care responsibility	-0.225	
Dual care responsibility by time	0.262	*
Informal care responsibility by time	0.023	
Child care responsibility by time	0.036	
Time (year of survey)	0.251	**
Female	1.012	**
Age	-0.043	**
Living with partner	-0.907	**
Employed part-time	0.238	
Unemployed	0.420	
Out of the labour force	1.024	**
Lives in regional area	-0.083	
Lives in remote area	-0.098	
Speaks English well	2.176	**
Born in Australia	-0.325	
Aboriginal or Torres Strait Islander	0.177	
Has finished Year 12	-0.286	
Has Bachelor's degree or higher	-0.641	**
Has certificate or diploma	0.157	
Income	0.000	
Female by time	-0.109	**
Living with partner by time	-0.027	
Employed part-time by time	-0.001	
Unemployed by time	0.245	**
Out of the labour force by time	0.036	
Lives in regional area by time	-0.001	
Lived in remote area by time	-0.045	
Speaks English well by time	0.130	
Born in Australia by time	-0.013	
Aboriginal or Torres Strait Islander by time	0.102	
Has finished Year 12 by time	-0.018	
Has Bachelor's degree or higher by time	-0.033	
Has certificate or diploma by time	-0.039	
Income by time	0.000	
Constant	16.563	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

Only one caring responsibility shows a statistically significant relationship with psychological distress in Table 7.13. This is dual caring over time. There are no immediate impacts of any caring responsibilities on psychological distress, and the effects of informal care and child care do not change over time. Dual carers, however show a significant slope of 0.262. This means that the longer Australians provide dual care, the levels of psychological distress that they experience grows. This relationship is illustrated below in Figure 7.9.

Figure 7.9 Impact of caring responsibilities on psychological distress



Source: HILDA, 2005-2013

Because there are no statistically significant differences for informal carers or child carers, they follow the same path as those with no caring responsibilities (making them essentially invisible in Figure 7.9). Dual carers start at the same average level of psychological distress as the rest of the Australian population (they do not exhibit a significant change in elevation). However, the figure clearly shows that the longer they provide dual care, the more psychological distress they experience. The model also identifies a statistically significant increase in psychological distress for the measure for time. This means that

entire population, regardless of caring responsibilities, is also reporting a small increase in psychological distress as time goes on.

Overall, all the variables assessing mental health have provided support for the idea that dual carers experience some form of role overload or caring burden. Each model presented here has shown that dual carers exhibit the strongest negative impacts on mental health as a result of taking on dual care responsibilities. All of the mental health measures, excepting psychological distress, also suggest that the provision on informal care has similar (but smaller) negative effects on mental health.

Life satisfaction

Just as the models assessing the impacts of caring on mental health have suggested, the models investigating life satisfaction also suggest that increased caring responsibilities have negative impacts on other areas of Australians' lives. Nine separate models are presented in the following section, each examining the ways in which the provision of care effects a range of areas of life satisfaction. The discussion of these results begins with the model for general life satisfaction.

General life satisfaction

The measure assessed in this model askes "All things considered, how satisfied are you with your life right now?". The results of this model suggest that the provision of all types of care have negative impacts on general life satisfaction. For this variable, Model G, with discontinuities in elevation and slope, allowing the magnitude of care by time to vary over time provides the best fit. The results of applying Model G to the measure for general life satisfaction are presented in the following, Table 7.14.

Table 7.14 Multilevel model results for general life satisfaction, coefficients

Dual care responsibility	-0.081	
Informal care responsibility	-0.078	**
Child care responsibility	-0.063	**
Dual care responsibility by time	-0.026	*
Informal care responsibility by time	0.001	
Child care responsibility by time	-0.008	*
Time (year of survey)	0.017	*
Inverse count	0.026	**
Female	0.026	
Age	0.000	
Living with partner	0.287	**
Employed part-time	0.124	**
Unemployed	-0.057	
Out of the labour force	0.108	**
Lives in regional area	0.083	**
Lives in remote area	0.160	**
Speaks English well	-0.353	**
Born in Australia	0.125	**
Aboriginal or Torres Strait Islander	0.073	
Has finished Year 12	-0.148	**
Has Bachelor's degree or higher	-0.246	**
Has certificate or diploma	-0.233	**
Income	0.000	
Female by time	0.004	
Living with partner by time	-0.006	*
Employed part-time by time	-0.011	**
Unemployed by time	-0.020	**
Out of the labour force by time	-0.018	**
Lives in regional area by time	0.003	
Lived in remote area by time	0.001	
Speaks English well by time	-0.008	
Born in Australia by time	-0.004	
Aboriginal or Torres Strait Islander by time	-0.004	
Has finished Year 12 by time	0.003	
Has Bachelor's degree or higher by time	0.016	**
Has certificate or diploma by time	0.013	**
Income by time	0.000	

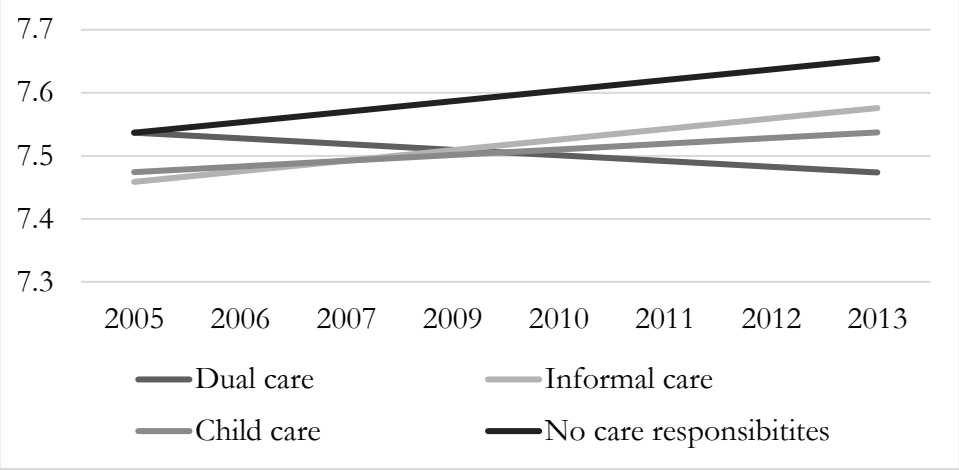
Constant	7.537	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

The results of this model suggest that there is no immediate impact on life satisfaction for dual carers when they begin dual caring. Dual carers do, however, experience a significant decline in life satisfaction as they continue to provide care over time, decreasing at a rate of -0.026 each year. Informal carers show a different (but still negative) relationship, with an immediate drop in life satisfaction of -0.078 when then begin providing care but no significant changes as time goes on. Child carers experience decreases in both elevation (-0.063) and slope (-0.008). When the changes in both elevation and slope are graphed, it is clear that by the end of the period examined dual carers' life satisfaction has declined the most. Given the statistically significant increase in life satisfaction of time, the slight decrease in slope for child carers is not visually as evident in Figure 7.10. as it would otherwise be.

Figure 7.10 Impact of caring responsibilities on life satisfaction



Source: HILDA, 2005-2013

It is interesting that while both informal carers and child carers experience an immediate reduction in life satisfaction on beginning their caring

responsibilities, dual carers do not. This could perhaps be due to the fact that most dual carers enter dual caring by acquiring an informal caring role (that is not many *acquire* informal and child care responsibilities *at the same time*). Given this, dual carers may have already experienced the 'shock' of becoming a carer and therefore don't have an immediate shift in life satisfaction when they become dual carers.

Dual carers still end up with the lowest reported life satisfactions scores though, and this is because their life satisfaction gets lower they longer provide dual care. This fits in with role overload theory which postulates that increased roles and responsibilities (such as dual caring) impact those occupying the increased roles with growing negative consequences as time goes on.

Satisfaction with free time

The first of the more specific life satisfaction questions asks respondents how satisfied they are with the amount of free time they have. The model that fit this question best is Model H, which includes discontinuities in elevation and slope, and allows the magnitude of care by time to vary randomly (but not care alone). The results of the multilevel model assessing the impact of caring on satisfaction with free time are illustrated in Table 7.15.

Table 7.15 Multilevel model results for satisfaction with free time, coefficients

Dual care responsibility	-1.254	**
Informal care responsibility	-0.421	**
Child care responsibility	-0.843	**
Dual care responsibility by time	0.003	
Informal care responsibility by time	-0.004	
Child care responsibility by time	-0.014	*
Time (year of survey)	0.008	
Inverse count	-0.006	
Female	-0.380	**
Age	0.016	**
Living with partner	-0.013	
Employed part-time	0.950	**
Unemployed	1.645	**
Out of the labour force	1.374	**
Lives in regional area	0.129	**
Lives in remote area	0.289	**
Speaks English well	-0.272	*
Born in Australia	0.088	*
Aboriginal or Torres Strait Islander	0.255	
Has finished Year 12	-0.091	*
Has Bachelor's degree or higher	-0.181	**
Has certificate or diploma	-0.186	**
Income	0.000	
Female by time	-0.001	
Living with partner by time	-0.012	*
Employed part-time by time	-0.012	
Unemployed by time	-0.019	
Out of the labour force by time	-0.024	**
Lives in regional area by time	-0.003	
Lived in remote area by time	0.016	
Speaks English well by time	-0.003	
Born in Australia by time	-0.005	
Aboriginal or Torres Strait Islander by time	0.015	
Has finished Year 12 by time	0.010	
Has Bachelor's degree or higher by time	0.019	**
Has certificate or diploma by time	0.011	
Income	0.000	

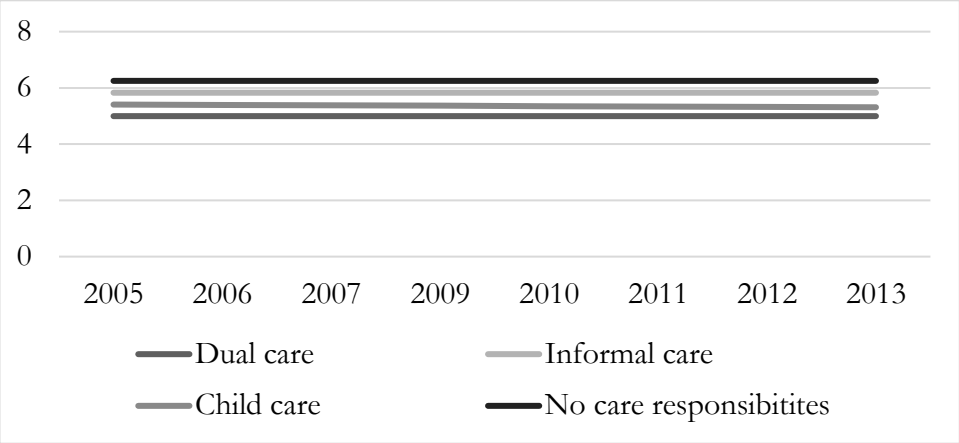
Constant	6.250	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

All three caring groups exhibit an immediate negative shift on commencing their caring responsibilities. Dual carers show the biggest drop in satisfaction with their free time, at -1.125, while child carers experience a slightly smaller reduction in free time satisfaction with a change in elevation of -0.843. Informal carers also exhibit a decrease in satisfaction with free time, but theirs is the smallest change at -0.421. Neither dual carers nor informal carers demonstrate increasing dissatisfaction (or satisfaction) with free time as time goes on. Child carers do exhibit a very slight additional negative slope of -0.014. The effects of caring responsibilities on satisfaction with free time are demonstrated in the following figure:

Figure 7.11 Impact of caring responsibilities on satisfaction with free time



Source: HILDA, 2005-2013

Once again, dual carers experience the strongest negative impact of the three types of caring groups. Once surprising result here is that child carers are significantly less happy with their free time than informal carers are. This could be due to the fact that both primary and secondary carers are included (and secondary carers would generally have more free time). This finding could also be related to unrealistic expectations regarding free time when people have children.

Satisfaction with health

Satisfaction with health is yet another area in which dual carers report significantly worse outcomes than both the non-caring population and other the caring groups. The best fit model for satisfaction with health is Model F, which allows changes in both elevation and slope and also allows care and care by time to vary randomly over time. The results of this model are shown below in Table 7.16.

Table 7.16 Multilevel model results for satisfaction with health, coefficients

Dual care responsibility	-0.078	
Informal care responsibility	0.034	
Child care responsibility	-0.078	**
Dual care responsibility by time	-0.034	*
Informal care responsibility by time	-0.011	
Child care responsibility by time	-0.003	
Time (year of survey)	-0.005	
Inverse count	0.043	**
Female	-0.093	**
Age	-0.019	**
Living with partner	-0.012	
Employed part-time	0.010	
Unemployed	0.036	
Out of the labour force	-0.211	**
Lives in regional area	0.061	**
Lives in remote area	0.291	**
Speaks English well	-0.462	**
Born in Australia	-0.075	*
Aboriginal or Torres Strait Islander	0.432	**
Has finished Year 12	-0.153	**
Has Bachelor's degree or higher	-0.075	*
Has certificate or diploma	-0.199	**
Income	0.000	
Female by time	0.009	*
Living with partner by time	0.007	
Employed part-time by time	-0.011	*
Unemployed by time	-0.021	*
Out of the labour force by time	-0.007	
Lives in regional area by time	-0.003	
Lived in remote area by time	-0.011	
Speaks English well by time	0.009	
Born in Australia by time	-0.004	
Aboriginal or Torres Strait Islander by time	-0.076	**
Has finished Year 12 by time	0.011	
Has Bachelor's degree or higher by time	0.023	**
Has certificate or diploma by time	0.010	*
Income	0.000	**

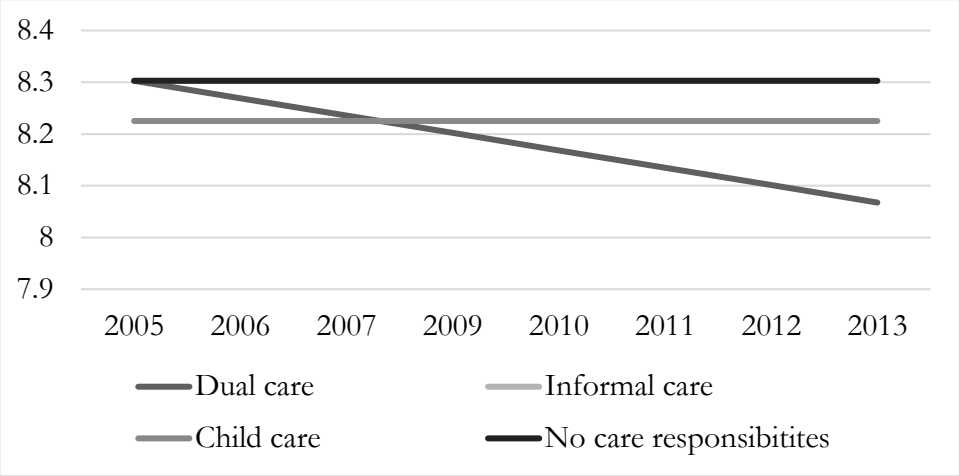
Constant	7.537	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

Although there is no immediate impact on health satisfaction for dual carers, they have a slope of -0.336 which illustrates worsening satisfaction with health over time. Informal carers do not show significant changes in elevation or slope. Child carers do show an immediate reduction of -0.078 but no increasing changes over time. The model assessing the impacts of care on satisfaction with health is displayed visually in Figure 7.12.

Figure 7.12 Impact of caring responsibilities on satisfaction with health



Source: HILDA, 2005-2013

Given that informal carers are not significantly different from those with no care responsibilities in this model, their line is hidden underneath the line for no care responsibilities in Figure 7.12. Dual carers experiencing the most continued reduction in satisfaction with their health continues to support the speculation offered in the literature review. It is also not particularly surprising given that earlier multilevel models assessing health (such as general health and wellbeing and vitality) showed dual care to have larger negative impacts than other caring responsibilities. Although the provision of informal care

does not demonstrate a significant impact in this model, it is possible that informal carers have small significant reductions in health satisfaction; the less complex models (which allow changes in only elevation or slope – not both) did show small significant reductions. There simply may not have been enough variance within the informal carers' results for it to show up when changes in both elevation and slope were allowed. Model F is presented here because it is the model which fits the data best overall, having the smallest deviance scores and still showing significant variance on two of the key caring groups.

Satisfaction with the home lived in

Satisfaction with the home lived in also follows the established pattern of dual care causing the most significant negative impacts. Once again, the most complex model, Model F provides the best fit for satisfaction with the home. This means that the model allows for discontinuities in both elevation and slope, whilst also allowing for the magnitude of care and care by time to vary over time. The results of Model F applied to satisfaction with the home lived in are presented in Table 7.17.

Table 7.17 Multilevel model results for satisfaction with the home lived in, coefficients

Dual care responsibility	-0.361	**
Informal care responsibility	-0.020	
Child care responsibility	-0.306	**
Dual care responsibility by time	-0.006	
Informal care responsibility by time	-0.010	
Child care responsibility by time	-0.005	
Time (year of survey)	0.012	
Inverse count	0.021	**
Female	0.002	
Age	0.010	**
Living with partner	0.076	**
Employed part-time	0.103	**
Unemployed	0.064	
Out of the labour force	0.125	**
Lives in regional area	0.221	**
Lives in remote area	-0.190	*
Speaks English well	-0.011	
Born in Australia	0.054	
Aboriginal or Torres Strait Islander	-0.143	
Has finished Year 12	-0.181	**
Has Bachelor's degree or higher	-0.247	**
Has certificate or diploma	-0.246	**
Income	0.000	
Female by time	0.002	
Living with partner by time	0.000	
Employed part-time by time	-0.006	
Unemployed by time	-0.016	
Out of the labour force by time	-0.008	
Lives in regional area by time	-0.011	*
Lived in remote area by time	0.024	
Speaks English well by time	-0.028	
Born in Australia by time	-0.001	
Aboriginal or Torres Strait Islander by time	0.016	*
Has finished Year 12 by time	0.016	*
Has Bachelor's degree or higher by time	0.019	**
Has certificate or diploma by time	0.008	
Income	0.000	

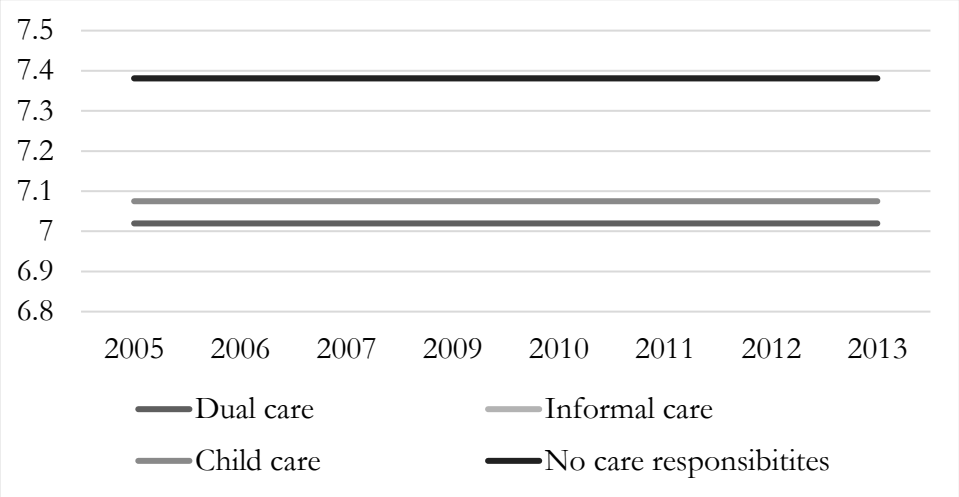
Constant	7.381	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

On becoming dual carers, Australians experience a drop in satisfaction with their homes of -0.361. Child carers experience a slightly smaller immediate reduction of -0.306, while informal carers do not demonstrate any significant change in satisfaction with the home they live in. Dissatisfaction with their homes does not intensify as time goes on for any of the caring groups. These results are illustrated in Figure 7.13. As was the case for the previous model, informal carers are again indiscernible from those with no care responsibilities in the figure below.

Figure 7.13 Impact of caring responsibilities on satisfaction with the home lived in



Source: HILDA, 2005-2013

These results make logical sense considering that both child carers and dual carers would have at least one care recipient live in the home with them (due to the operational definition of child care). According to the HILDA data, approximately half of all informal carers provide care to someone who lives elsewhere (and not to anyone in their own home). Providing care within the

home, as all child carers and dual carers would do, could place additional strains on the home in terms of size (such as extra bedrooms) or facilities (eg. stairs could become a danger) thus increasing dissatisfaction with the home they live in.

Satisfaction with financial situation

Satisfaction with financial situation is another variable in which dual carers exhibit worse outcomes than those who provide other types of caring responsibilities. Again, Model F fits this question best. The results of the multilevel model assessing the impacts of care on financial satisfaction are displayed in Table 7.18.

Table 7.18 Multilevel model results for satisfaction with financial situation, coefficients

Dual care responsibility	-0.399	**
Informal care responsibility	-0.126	**
Child care responsibility	-0.177	**
Dual care responsibility by time	0.003	
Informal care responsibility by time	0.009	
Child care responsibility by time	-0.014	**
Time (year of survey)	0.013	
Inverse count	0.013	*
Female	0.098	**
Age	0.016	**
Living with partner	0.331	**
Employed part-time	-0.190	**
Unemployed	-1.382	**
Out of the labour force	-0.559	**
Lives in regional area	0.026	
Lives in remote area	0.353	**
Speaks English well	-0.255	*
Born in Australia	0.141	**
Aboriginal or Torres Strait Islander	0.201	
Has finished Year 12	-0.198	**
Has Bachelor's degree or higher	-0.023	
Has certificate or diploma	-0.263	**
Income	0.000	**
Female by time	0.010	*
Living with partner by time	-0.011	*
Employed part-time by time	-0.013	*
Unemployed by time	-0.018	
Out of the labour force by time	-0.006	
Lives in regional area by time	-0.002	
Lived in remote area by time	0.004	
Speaks English well by time	-0.013	
Born in Australia by time	0.003	
Aboriginal or Torres Strait Islander by time	-0.066	*
Has finished Year 12 by time	-0.005	
Has Bachelor's degree or higher by time	0.006	
Has certificate or diploma by time	-0.007	
Income	0.000	

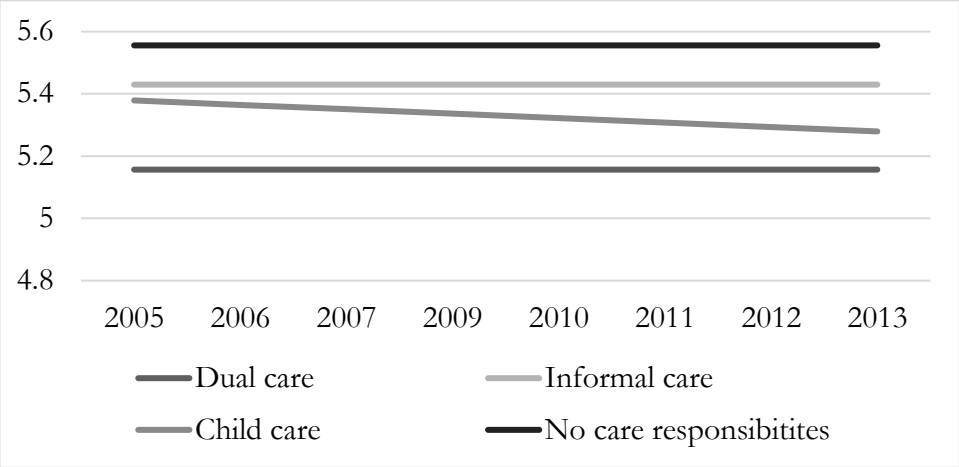
Constant	5.556	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

All three caring groups experience an immediate reduction in satisfaction with their financial situations when they begin their caring responsibilities. Dual carers' reduction (-0.399) is double what informal carers and child carers undergo, whose satisfaction changes by -0.126 and -0.177 respectively. In addition to the immediate shift in elevation, the model used also allows for financial situation satisfaction to vary over time. Despite this allowance, informal and dual carers remain on the same slope after their initial decrease in satisfaction, while child carers experience an additional change in slope of -0.014, as can be seen in Figure 7.14.

Figure 7.14 Impact of caring responsibilities on satisfaction with financial situation



Source: HILDA, 2005-2013

These results suggest that dual carers, informal carers and child carers all face an initial adjustment to the increased costs of providing care, and perhaps reduced income or labour force participation. Though the decrease in satisfaction only intensifies over time for child carers, dual carers still exhibit the lowest levels of satisfaction with their financial situations by the end of the time period examined.

Satisfaction with feeling safe

Satisfaction with feeling safe is the first of the life satisfaction measures that does not fit the pattern of dual carers exhibiting the worst outcomes. For the examination of satisfaction with how safe respondents feel, Model G provides the best fit. This model includes discontinuities in elevation and slope, whilst allowing care by time to vary randomly. Its results are shown in Table 7.19.

Table 7.19 Multilevel model results for satisfaction with feeling safe, coefficients

Dual care responsibility	-0.105	
Informal care responsibility	0.017	
Child care responsibility	-0.178	**
Dual care responsibility by time	-0.032	*
Informal care responsibility by time	-0.009	
Child care responsibility by time	0.003	
Time (year of survey)	0.032	**
Inverse count	0.018	**
Female	-0.119	**
Age	-0.006	**
Living with partner	0.153	**
Employed part-time	0.028	
Unemployed	-0.030	
Out of the labour force	-0.007	
Lives in regional area	0.296	**
Lives in remote area	0.374	**
Speaks English well	-0.243	*
Born in Australia	0.208	**
Aboriginal or Torres Strait Islander	0.014	
Has finished Year 12	-0.127	**
Has Bachelor's degree or higher	-0.031	
Has certificate or diploma	-0.196	**
Income	0.000	
Female by time	-0.001	
Living with partner by time	-0.001	
Employed part-time by time	-0.003	
Unemployed by time	-0.011	
Out of the labour force by time	0.002	
Lives in regional area by time	-0.006	
Lived in remote area by time	-0.025	*
Speaks English well by time	-0.021	
Born in Australia by time	-0.001	
Aboriginal or Torres Strait Islander by time	-0.011	
Has finished Year 12 by time	0.001	
Has Bachelor's degree or higher by time	0.008	
Has certificate or diploma by time	0.004	
Income	0.000	

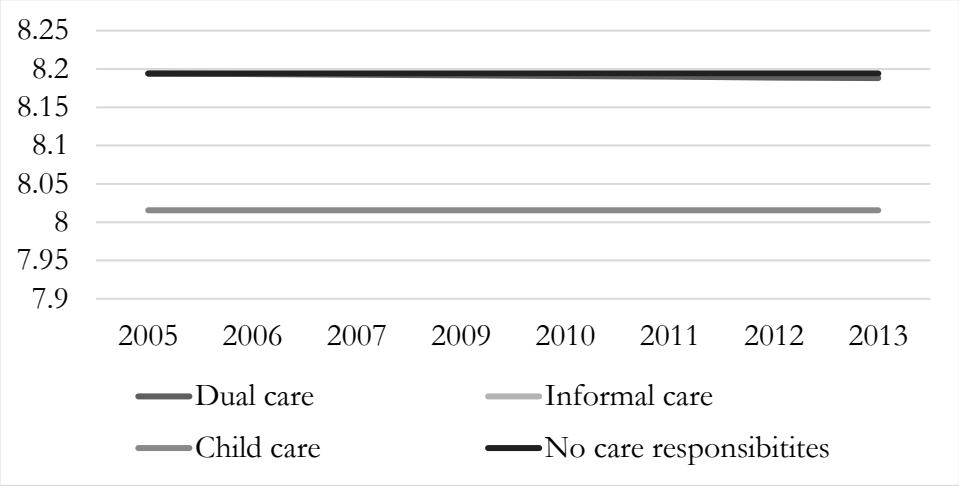
Constant	8.194	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

The results of this model are interesting. Dual carers do not undergo an immediate shift in safety satisfaction on becoming dual carers, but the slope is significant at -0.032. This means that dual carers' feelings of dissatisfaction with safety intensify the longer that they provide dual care. There are no significant impacts of being a informal carer on feelings of safety. Child carers demonstrate a reduction in feeling safe when they begin caring (-0.178), but unlike dual carers, these feelings do not intensify over time. As is illustrated in Figure 7.15, even with the (small) negative slope for dual carers, satisfaction with feeling safe is still demonstrably lower as a result of child care alone.

Figure 7.15 Impact of caring responsibilities on satisfaction with feeling safe



Source: HILDA, 2005-2013

Informal carers are again not visible in the above figure because they are not statistically different from those with no care responsibilities in the model illustrated. Dual carers are also difficult (but still possible) to see because the negative slope they experience is quite small, meaning their line is very close

to the line for those with no caring responsibilities. The interesting aspect of this model is that having children present in the home appears to significantly reduce respondents' satisfaction with how safe they feel. Dual carers and child carers are the only two caring groups guaranteed to have children present, whereas informal carers (by definition) do not. This finding raises speculation that having children could create feelings of vulnerability not otherwise experienced.

Satisfaction with feeling part of your local community

Caring responsibilities in general appear to be weak predictors of satisfaction with feeling part of the local community. Only the provision of child care has a statistically significant relationship with this type of satisfaction. Model G is the best fitting model for this variable, allowing changes in elevation and slope, and care to vary randomly. The results presented in Table 7.20 demonstrate that, for the most part, caring responsibilities do not have a statistically significant impact on satisfaction with feeling part of the local community.

Table 7.20 Multilevel model results for satisfaction with the local community, coefficients

Dual care responsibility	0.093	
Informal care responsibility	-0.027	
Child care responsibility	0.023	
Dual care responsibility by time	-0.003	
Informal care responsibility by time	0.008	
Child care responsibility by time	0.011	*
Time (year of survey)	-0.003	
Inverse count	0.046	**
Female	0.056	
Age	0.011	**
Living with partner	0.020	
Employed part-time	0.127	**
Unemployed	-0.062	
Out of the labour force	0.004	
Lives in regional area	0.426	**
Lives in remote area	1.080	**
Speaks English well	0.015	
Born in Australia	0.159	**
Aboriginal or Torres Strait Islander	0.400	*
Has finished Year 12	-0.287	**
Has Bachelor's degree or higher	-0.166	**
Has certificate or diploma	-0.326	**
Income	0.000	
Female by time	0.005	
Living with partner by time	0.012	*
Employed part-time by time	-0.008	
Unemployed by time	-0.016	
Out of the labour force by time	0.003	
Lives in regional area by time	-0.007	
Lived in remote area by time	-0.016	
Speaks English well by time	-0.026	
Born in Australia by time	-0.003	
Aboriginal or Torres Strait Islander by time	-0.047	
Has finished Year 12 by time	0.010	
Has Bachelor's degree or higher by time	0.028	**
Has certificate or diploma by time	0.022	**
Income	0.000	

Constant	5.790	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

Given that only the provision of child care shows a statistically significant relationship with satisfaction with feeling part of the local community, the results of the above table have not been represented visually in a figure. The impact of child care is a slight improvement in slope of 0.011, showing that over time, those who provide child care become more satisfied with feeling part of the local community. This result is not particularly surprising as having children provides many opportunities for engagement with the local community, whether it be through the child's school, sporting or other extra-curricular activities or simply increased social engagement though the friends of the child.

Satisfaction with employment opportunities

Similar to the previous model, caring responsibilities generally do not show a statistically significant impact on satisfaction with employment opportunities. Model H proves to be the best fit model for this variable, which allows for changes in elevation and slope, and allows care by time to vary randomly over time. The results of this model, displayed below in Table 7.21, clearly show that only child care responsibilities impact on satisfaction with employment opportunities.

Table 7.21 Multilevel model results for satisfaction with employment opportunities, coefficients

Dual care responsibility	-0.169	
Informal care responsibility	-0.080	
Child care responsibility	-0.009	
Dual care responsibility by time	0.009	
Informal care responsibility by time	0.004	
Child care responsibility by time	-0.023	**
Time (year of survey)	-0.007	
Inverse count	0.009	
Female	0.020	
Age	0.002	**
Living with partner	0.032	
Employed part-time	-0.353	**
Unemployed	-1.598	**
Out of the labour force	-1.437	**
Lives in regional area	-0.091	**
Lives in remote area	-0.071	
Speaks English well	-0.743	**
Born in Australia	0.260	**
Aboriginal or Torres Strait Islander	-0.419	*
Has finished Year 12	0.118	**
Has Bachelor's degree or higher	0.235	**
Has certificate or diploma	0.068	
Income	0.000	**
Female by time	-0.001	
Living with partner by time	0.013	*
Employed part-time by time	0.023	**
Unemployed by time	-0.018	
Out of the labour force by time	0.076	**
Lives in regional area by time	-0.004	
Lived in remote area by time	0.048	**
Speaks English well by time	0.032	
Born in Australia by time	-0.008	
Aboriginal or Torres Strait Islander by time	0.043	
Has finished Year 12 by time	-0.028	**
Has Bachelor's degree or higher by time	-0.025	**
Has certificate or diploma by time	-0.013	
Income	0.000	

Constant	7.159	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

The provision of child care is associated with a negative slope in satisfaction with employment opportunities of -0.023. This means that those who provide child care become increasingly dissatisfied with their employment opportunities as time goes on. As child care is the only caring responsibility to exhibit a statistically significant impact, these results are not illustrated in a separate figure.

Satisfaction with the neighbourhood lived in

The final variable to be investigated through the use of multilevel models is satisfaction with the neighbourhood lived in. This model follows the same pattern as the previous two and shows that generally, the provision of care does not impact this type of satisfaction, with the exception of child care. Model H provides the best fit for the investigation of satisfaction with the neighbourhood lived in. The results of this model can be seen in the following table, Table 7.22.

Table 7.22 Multilevel model results for satisfaction with the neighbourhood lived in, coefficients

Dual care responsibility	-0.069	
Informal care responsibility	-0.060	
Child care responsibility	-0.065	*
Dual care responsibility by time	0.000	
Informal care responsibility by time	0.009	
Child care responsibility by time	0.004	
Time (year of survey)	-0.003	
Inverse count	0.031	**
Female	0.027	
Age	0.008	**
Living with partner	0.055	*
Employed part-time	0.041	
Unemployed	-0.057	
Out of the labour force	-0.044	
Lives in regional area	0.283	**
Lives in remote area	0.174	*
Speaks English well	-0.065	
Born in Australia	0.121	**
Aboriginal or Torres Strait Islander	0.128	
Has finished Year 12	-0.070	*
Has Bachelor's degree or higher	-0.060	
Has certificate or diploma	-0.149	**
Income	0.000	
Female by time	0.002	
Living with partner by time	0.004	
Employed part-time by time	-0.006	
Unemployed by time	-0.007	
Out of the labour force by time	-0.005	
Lives in regional area by time	-0.006	
Lived in remote area by time	-0.001	
Speaks English well by time	-0.039	*
Born in Australia by time	0.000	
Aboriginal or Torres Strait Islander by time	-0.031	
Has finished Year 12 by time	0.004	
Has Bachelor's degree or higher by time	0.019	**
Has certificate or diploma by time	0.006	
Income	0.000	

Constant	7.129	**

**significant at p<0.01, *significant at p<0.05

Source: HILDA, 2005-2013

Once again, given the general lack of significant impacts of caring responsibilities, the results of this model have not been represented in a more visual figure. The only significant caring responsibility uncovered in the model is a change in elevation for child carers. On picking up a child caring responsibility, Australians demonstrate an immediate reduction in satisfaction with the neighbourhood lived in. This change does not worsen nor improve over time. It may be that when Australians become parents, they re-evaluate their needs in regards to the neighbourhood they live in. A lack of local resources such as local parks or green spaces, or the presence of hazards such as busy roads may reduce satisfaction with the neighbourhood lived in when they may not have been issues prior to caring for children.

Conclusion

This chapter analysed the impacts of the provision of care in general, and the impacts of dual care in particular. Overall, it has been demonstrated that the provision of care does indeed impact many other areas, and the provision of dual care in particular has its own unique impacts. As such, this chapter has answered the second key research question of the thesis; the impacts of dual care have been identified and it has been demonstrated that their impacts are different to the impacts of informal care and child care (as measured against the reference category of those with no caring responsibilities).

Within the results of the multilevel models, much support has been found for the ideas of role overload theory. Specifically, the findings of the literature review suggest that Australians providing dual care are at risk of role overload – resulting in higher stress levels, poorer mental and physical health, and lower life satisfaction.

Before arriving at these conclusions, this chapter began by presenting the methodology of multilevel modelling. This involved an explanation of what multilevel modelling is, as well as its purpose in a longitudinal setting. The specific ways in which the multilevel model measures change were outlined and equations provided to ensure an in-depth understanding of how the models work. Methodological decisions were explained and the specific ways that variables are constructed for this analysis have been presented.

The discussion of the results of the multilevel models began with the presentation of Table 7.3, which aggregates the significant impacts of caring responsibilities as found in all the dependent variables investigated. The table clearly demonstrates that in all but three of the variables examined, the provision of dual care has significant, unique impacts. Again, it is important to clarify that these impacts are measured against the reference category of no caring responsibilities.

Following the table of aggregated results, each measure investigated was examined individually. Beginning with relationship status, it was shown that the provision of dual care initially increases living with a partner, but the longer that dual care is provided, the likelihood of living with a partner actually decreases. This could be an indication that the stresses of providing dual care over time can result in relationship breakdown, or it could simply reflect those caring for a spouse who later died. The model addressing labour force participation shows that providing dual care causes an initial reduction in employment, but this pattern changes over time with dual carers actually increasing their labour force participation as they continue providing care. The provision of dual care was also found to increase income initially, which was a surprising result. It was theorized that this could be artificially inflated due to those with lower incomes leaving employment on taking on their additional caring responsibilities.

Four multilevel models were performed assessing the impacts of caring on physical health. In the analysis for two of these variables; general health and wellbeing and vitality, the provision of dual care is found to cause the largest significant reductions out of all of the different caring responsibilities (as measured against the reference category of no caring responsibilities). The two remaining physical health variables; bodily pain and physical functioning do not appear to be significantly impacted by the provision of care in general, or by dual care in particular.

Another four multilevel models investigate the impacts of caring on mental health. These measures include mental health, emotional health, social functioning and psychological distress. The results presented demonstrate that for all four measures of mental health, the provision of dual care causes significant adverse outcomes, and in all cases those outcomes are worse for dual carers than they are for informal carers or child carers.

Finally, the impacts of caring on life satisfaction were assessed through the examination of nine separate variables. Dual care provision proves to have a significant negative impact on six of those measures. The life satisfaction variables impacted by dual care are; general life satisfaction, satisfaction with free time, satisfaction with health, satisfaction with the home lived in, satisfaction with financial situation, and satisfaction with feeling safe. For three of the satisfaction measures dual care and informal care demonstrate no significant impacts in either direction. These variables are; satisfaction with employment opportunities, satisfaction with feeling part of the local community and satisfaction with the neighbourhood lived in. For the bulk of the life satisfaction variables, dual care generally produces the worst outcomes for feeling satisfied (out of the different caring responsibilities).

When considered in conjunction with each other, the results of all the multilevel models show a clear pattern. Dual care is frequently associated with the poorest outcomes across nearly all measures examined. This is compared

to all other caring responsibilities but specifically using 'no caring responsibilities' as the reference group. The analysis shows that providing dual care lowers; most areas of life satisfaction, half of the physical health variables examined, all of the mental health variables investigated, labour force participation (initially) and living with a partner (over time). These results show strong support for one hypothesis suggested in the literature review. This is, of course the theory of role overload. Role overload theory argues that when individuals have an increased number of roles and responsibilities, the associated strain and stress from fulfilling those expectations leads the negative outcomes in a variety of areas. It was theorised that dual carers could be especially vulnerable to role overload, given their increased caring responsibilities. The key implication of the findings presented in this chapter is therefore the likelihood that role overload is a very real phenomenon experienced by dual carers in Australia. The existence of role overload for dual carers is relevant given the importance of the informal provision of care in Australian society. Providing an understanding of how dual care impacts carers is the first crucial step towards mitigating those negative impacts, so that those who provide dual care can continue to do so without additional burden.

The above discussion of the impacts of providing dual care closes the presentation of the results of this thesis. The following final chapter of this thesis is the conclusion. The conclusion chapter provides a summary of all the finding of this thesis, discusses their importance and implications while identifying areas for further research.

Chapter Eight – Conclusion

Introduction

This thesis has thoroughly investigated the provision of dual care in Australia. With the need for informal care in Australia likely to grow, it is increasingly crucial that the predictors and impacts of providing care are properly understood. As was demonstrated in the literature review chapters, there already exists a reasonable body of knowledge regarding the predictors and impacts of providing informal care, and providing child care as separate experiences. Prior to the research of this thesis, there was no literature identifying or examining the predictors and impacts of those who provide both types of care at once – the dual carers.

This chapter concludes the research presented in this thesis. It summarizes the key findings of each of the substantive chapters, focusing on the demonstrable ways in which the provision of dual care differs significantly from the provision of informal care or child care separately, and the ways in which dual carers differ from the Australian population with no caring responsibilities at all.

The limitations of this research are outlined and suggestions for future research made. Finally, the original contributions of this research are clearly stated, thus illustrating the significant ways in which this thesis adds to the existing body of knowledge about the provision of care in Australia.

Revisiting the research questions

In order to show that this thesis answers the questions it originally posed, the key research questions and aims must be restated. The overarching research question, or aim, of the thesis was to reveal whether or not dual carers are different from the rest of the Australian population, and if so, establish the

ways in which are they different. This broad line of inquiry narrows down to two specific research questions. These questions are:

1. What are the predictors of dual care, and how are they different from the predictors of other caring behaviours?
2. What are the impacts of dual care, and how are they different from the impacts of other caring behaviours?

Addressing the original overarching research question is simple at this point. The results of the thesis show conclusively that, yes; dual carers are significantly different from the rest of the Australian population. The predictors and impacts of dual care are also demonstrably unique from the predictors and impacts of informal care and child care.

Answering the research questions

Answering the specific research questions in detail requires some referral back to the findings of each substantive chapter. This begins with a revisiting of the reviewed literature.

Literature review findings

The findings of the literature review were spread across two chapters; Chapter Two – The Concept of Care, and Chapter Three – The Known Predictors and Impacts of Care. Chapter Two provided the background of the concept of care as a whole. It also provided clear definitions of the types of caregiving that were examined in the thesis; dual care, informal care and child care, and situated them within existing theories of care. We learned in this chapter that care is a loaded term and encompasses a wide range of understandings.

The second half of the reviewed literature was examined in Chapter Three. This chapter illustrated the current state of informal and child care in Australia. It identified and examined the existing literature regarding the

predictors and impacts of informal care and child care, and speculated how this knowledge could be applied to dual carers. The speculation of what the likely predictors and impacts of dual care could be arose not only from the observed statistics surrounding informal and child care, but also from three key theoretical perspectives. These were gender theories, life course theory and role overload / role enhancement theory. Gender and life course theories provided the theoretical basis for the expectation that certain characteristics would make Australians more or less likely to become dual carers. These characteristics included, but were not limited to; sex, age, and other demographic and socio-economic traits. Role overload theory (also referred to as role conflict theory and the scarcity hypothesis) offered the foundation of the expectation that dual carers could experience additional stress as a result of the pressure of their increased caring responsibilities. In role overload theory, the increased stress can have flow on adverse effects on a wide range of areas, such as physical and mental health and wellbeing, life satisfaction, employment, and relationships. The somewhat outdated theory of the burden of care also offered support and further explanations as to why dual caring could have adverse impacts on those providing care.

The reviewed literature also presented the possibility that dual care could provide positive enhancement to the lives of those providing care. It was speculated that much of positive impacts of dual caring would be somewhat invisible to this research, primarily because those theorized impacts would be difficult to capture in a quantitative setting. However, the idea of role enhancement did provide an avenue through which a positive impact of dual care could be measured. Role enhancement theory suggests that occupying multiple roles (as dual carers do) could improve wellbeing through enhanced access to "a range of sources of positive social interaction, pleasurable activity, achievement, and status" (Lee and Powers 2002: 196). Having reviewed the existing research regarding the provision of informal and child care in Australia, the literature review chapters highlighted the substantial gap in the

literature regarding the provision of dual care. In conjunction with the theories mentioned above, the existing research provided some direction as to what the likely predictors and impacts of dual care would be. Those predictors and impacts of dual care were uncovered and presented in the three results chapters.

Observational findings

The first chapter to report results was Chapter Five - Illustrating Dual Care in Australia. This presented descriptive and cross sectional results from HILDA and Census data. It illustrated the correlations between dual caring and other variables, but did not explore the causal links between the two. This chapter also provided essential information regarding the incidence of dual caring in Australia, the length of time that dual carers care for, and the ways in which dual carers 'enter' dual caring.

HILDA data indicates that around 1.9 percent of the Australian population provides dual care. Estimates using Census data put this percentage higher, at 5.3 percent. The HILDA data did not show significant changes in the incidence of dual caring over time, and Census data was unable to comment on changes over time. It was demonstrated that dual carers tend to only have one or two spells of providing dual care; this means that there is not a lot of movement in and out of dual caring. It was also discovered that the vast majority of dual carers (94 percent) enter dual caring with an existing child care responsibility.

Comparison between the two data sets also allowed some insight into the consequences of the operational definition of dual care. The definition of dual care in the HILDA data set (which was used for all subsequent analysis) excludes grandparents providing child care to their grandchildren. The analysis of Census data in Chapter Five showed that this is a substantial group, and their exclusion has implications for analysis performed using that

more conservative measure. These implications included; a smaller overall proportion and number of identified dual carers in the HILDA data, and a different age structure of dual carers, with dual carers in HILDA being significantly younger.

Aside from the comparison of the definitions of dual care, the results of Chapter Five provided the first piece of confirmation that dual carers are different to the rest of the Australian population (without making any claims regarding causality). Dual carers were shown to have larger proportions of women, of those living with a partner, and the largest proportions of unemployment and part time employment (but higher levels of income). This chapter also demonstrated that dual carers report lower life satisfaction scores, and lower levels of physical and mental health and wellbeing than Australians with other (or no) caring responsibilities.

Overall, the results of this chapter demonstrated clearly that dual carers are significantly different to informal carers, child carers and the non-caring population. This provided strong justification to further examine the differences in a longitudinal setting, separating out the predictors and the impacts of dual care.

Predictors of dual care findings

The predictors of dual care were outlined in Chapter Five – The Predictors of Dual Caring. This chapter focused on examining the results of the event-history analysis. The aim of this chapter was to identify and analyse the characteristics that predispose Australians to becoming dual carers, and identify how those predictors of dual care differ to the predictors of informal care and child care. This analysis focused firstly on the variables that must logically precede informal caring, such as sex and age, as well as the many variables that were identified in the literature review and observational findings as being associated with the provision of care.

The discrete time hazard models clearly identified a number of variables that increase the hazard of becoming a dual carer. In other words, it revealed which variables predict dual caring and showed how strongly they do so. This research confirmed the theories of the literature review which suggested a number of demographic and socio-economic characteristics would play a role in who becomes a dual carer. Gender, age, relationship status, education, employment and income all significantly predicted the hazard of becoming a dual carer. Specifically, this analysis showed that being female, living with a partner (the risk is particularly high for partnered women), being aged 25 to 54 in general (and 35 to 44 in particular), not being employed full-time (especially being unemployed), not having a bachelor's degree or higher and having a higher disposable income all significantly increase the risk of becoming a dual carer.

As well as identifying (for the first time) the characteristics which predict dual care, this thesis also revealed that those predictors of dual care differ from the predictors of informal care and child care, when each caring group is compared to those with no caring responsibilities. It was shown that informal care is not predicted by sex or relationship status in general, although partnered women do experience an increased hazard of informal care. Age determines the risk of informal caring quite differently to the hazard of dual caring; being aged over 45 increases the risk in general, with a specific increase in hazard for those aged 55 to 64. Country of birth was not a significant predictor of dual care, however, being born outside of Australia does increase the hazard of informal care, as does being unemployed or out of the labour force (but not being employed part-time). Finally, an increased income slightly reduces the risk of providing informal care, which is the opposite pattern to the risk of dual caring.

The hazard of providing child care was also shown to be predicted by different characteristics than those that predict dual care. Although the risk of

providing child care is increased by being female and being partnered, especially so for partnered woman, there are still differences to the hazard of dual care. For child care, sex is the weaker predictor and relationship status the stronger predictor of risk; dual carers exhibit the opposite pattern. The other predictors of child care are; being aged 25 to 34 (younger than the hazardous ages for dual care), speaking English well and living in a remote area, neither of which significantly predict the risk of dual caring. Other characteristics which increase the hazard of child care include; not being in full-time employment (particularly being out of the labour force) having a higher income and having a certificate, diploma, Bachelor's degree or higher. For dual caring the employment risks were similar, but being unemployed poses the strongest hazard, not being out of the labour force. The hazardous education levels are also quite different, as *not* having a bachelor's degree is the only characteristic to increase the hazard of dual care.

Demonstrably, the results examined in Chapter Six have shown that the hazard of providing dual care is predicted by certain characteristics, and those predictors of dual care are different to the characteristics that increase the risk of providing informal care and child care. Thus, the results presented in Chapter Six have conclusively answered the first key research question of the thesis; what are the predictors of dual care, and how are they different from the predictors of other caring behaviours?

Impacts of dual care findings

The third and final section of findings were presented in Chapter Seven – The Impacts of Dual Caring. Using multilevel modelling, this chapter explored what happens to people after they become dual carers, thus answering the second key research question of the thesis; what are the impacts of providing dual care, and are they different to the impacts of other types of caring? The results showed that the impacts of dual caring are significant and different to

the experiences of those who provide informal care, those who provide child care and those with no caring responsibilities.

In answering this research question, multilevel models were performed on a number of different dependent variables to see if changes in caring responsibilities exhibited an immediate impact on the given dependent variable (a discontinuity in elevation), an impact that intensified over time as caring continued, (a discontinuity in slope), or both types of change (discontinuities in elevation and slope). The dependent variables examined in the multilevel models were divided into four categories; demographic characteristics, economic characteristics, health and well-being indicators, and life satisfaction.

The key impacts of the provision of dual care were identified by this thesis as adverse reductions in; most areas of life satisfaction, half of the physical health variables examined, all of the mental health variables investigated, labour force participation (initially) and living with a partner (over time). When considered in conjunction with the impacts of informal and child care, a clear pattern emerged; dual care is frequently associated with the poorest outcomes across nearly all measures examined. It is important to reiterate here that these differences are observable though comparison to the reference group of those with no caring responsibilities. Therefore, the results presented in Chapter Seven have decisively answered the second key research question of the thesis; what are the impacts of dual care, and how are they different from the impacts of other caring behaviours?

Theoretical implications

Daly and Lewis (2000) were quoted in the literature that "care has for long been a woman-specific concept". The findings of this thesis demonstrate clearly that it still is. The continued gendered nature of caring in Australia has been illustrated in the dominance of women in providing all types of care;

informal, child and dual care. These findings strongly support the gender theories of care presented in Chapter Three; namely that women, either through an inherent 'ethic of care' or through socialization and societal expectations, meet the majority of a societies caring requirements, even if meeting those needs has negative impacts on the women who provide care. It was shown that the provision of all types of care can have negative impacts, and that the provision of dual care in particular is generally associated with the worst outcomes. Although the differing ways in which dual care impacts men and women was not specifically examined (due to an inadequate number of male dual carers), it is probable that the provision of dual care has stronger impacts on women than it does on men, given that this is the relationship demonstrated for informal and child care in the reviewed literature.

Support was also found for the life course perspective, which argues that there are a number of macro and micro level factors which interact with one another, ultimately shaping the events and roles that individuals experience at different points in their individual life courses. The life course perspective was particularly useful in identifying the predictors of different caring behaviours. The results of the event-history analysis clearly show that this theoretical perspective is relevant to this research, as there are a number of identified characteristics which impact the likelihood of experiencing certain life events (becoming an informal carer, child carer or a dual carer).

The final theoretical perspective to find support in the results of this research is role overload theory. These results supplied significant support for the ideas of role overload theory. To reiterate, the findings of the literature review suggested that Australians providing dual care could be at risk of role overload – resulting in higher stress levels, poorer mental and physical health, and lower life satisfaction. This relationship was clearly demonstrated in the results of Chapter Seven; dual care was nearly consistently associated with the worst outcomes on almost all areas examined. No support was found in this analysis

for the counter argument of role enhancement theory; if there are positive impacts born of providing dual care, this research was not able to uncover them. The inability of this research to identify any positive effects of providing dual care brings us to the discussion of the limitations of the thesis, and suggestions of areas for further research.

Limitations and opportunities for future research

One of the main limitations of this research is that it did not uncover any clear positive impacts of the provision of dual care. As was outlined in Chapter Two – The Concept of Care, many studies in the field of care focus on the negative aspects of providing care. Seeing care as a burden is a problematic view that oversimplifies the complex caring relationship. Much of the existing literature in care is based on quantitative research. It was suggested that the existing body of literature finds so many negative effects of caring because of the reliance on quantitative research. This is because, generally, the questions which are easily quantifiable (and therefore commonly reported on) are the ones that do have negative impacts. The positive impacts of care are likely to be less quantifiable things, such as feeling a sense of purpose through the provision of care, feeling a strong connection through the caring relationship, or a feeling of relief that a loved one is being properly cared for. Identifying the positive impacts of care in general, or dual care specifically, would therefore require a qualitative approach. Thus, the first opportunity for further research uncovered in this thesis is a qualitative examination of dual care, focusing on the ways in dual carers feel that their caring relationships have enhanced or improved their lives.

The second opportunity for further research was revealed in Chapter Five – Illustrating Dual Care in Australia. Comparison of similar cross sectional analyses on two different data sets illuminated the issue of the limited operational definition of dual care within HILDA. As has been clarified many

times, the operational definition of dual care (and child care) when using HILDA data excludes grandparents providing care to grandchildren. This exclusion is due to limitations inherent in the HILDA data set. It was demonstrated in Chapter Five that this more conservative definition of dual care (which was used for all of the longitudinal analyses) likely under-represents the number and proportion of dual carers in Australia. At the least, it was shown that it also significantly changes the age structure of dual carers (making them appear much younger than the more inclusive definition would indicate). It is possible that there are further differences caused by the different definitions that were not identified in Chapter Five. An opportunity for further research has therefore been identified as investigation into dual carers using a more inclusive operational definition of dual carers. At the time of this research, data which allows this *and is longitudinal* was not available. In the future, as further waves of Census data are released; it is possible that Census data will provide the opportunity to further this line of research.

In the event of truly longitudinal, individual-level Census data becoming available, there is another opportunity for further research which would become attainable. Chapter Five briefly showed that dual care is particularly prevalent in the Australian Indigenous and Torres Strait Islander population. This increased rate of dual care was not further investigated in this thesis due to inadequate representation of Indigenous and Torres Strait Islander Australians in the HILDA data. The examination of dual care within the Indigenous Australian population therefore presents another significant opportunity for further research.

The final opportunity for further research identified in this thesis is the interaction between gender and the impacts of dual care. As was demonstrated in the reviewed literature, the provision of informal care and child care (separately) has differing impacts on men and women, with women generally experiencing more negative outcomes than men. Given the other

findings of this research regarding the provision of dual care and gender, it is probable that dual care also has a disproportionately negative impact on female dual carers (compared to male dual carers). Due the small number and proportion of male dual carers in the HILDA data set, this relationship was not fully explored within this thesis. It therefore presents the final area for further research.

Although there are some areas which form limitations in this research, the thesis nevertheless makes an original, significant contribution to knowledge. The details of this contribution are presented in the following section.

Contributions

This thesis makes an original contribution to knowledge by examining dual caring in Australia, and identifying and analysing the predictors and impacts of providing dual care.

The ageing of Australia's population, delayed childbearing, and increased female labour force participation are trends which are likely to increase Australia's caring needs in the future. Some of these demographic trends will also reduce the availability of people to provide care. Given that the majority of our care needs are currently met informally, the provision of our future caring needs is likely to fall to the informal sector as well.

Dual carers are currently responsible for meeting a lot of Australia's caring needs. They provide both informal care to someone who is frail aged, has a long-term illness or disability *as well* as providing child care. As is the case with care in general, dual carers are likely to be both more in demand and less available in the future.

Obtaining a complete comprehension of dual care is important because this knowledge will facilitate meeting the increasing care demands of the

Australian population. Failure to develop this understanding will result in a serious reduction in Australia's ability to meet its caring needs.

Prior to the research of this thesis, we ***did not know*** what characteristics made people more likely to take on a dual caring responsibility. We also ***did not know*** what the impacts of taking on a dual caring responsibility were. This research has made an original contribution to knowledge by investigating dual care in Australia and revealing the unique predictors and impacts of dual caring.

Armed with this new-found knowledge, policy can be targeted towards the areas in which dual carers are most likely to experience negative impacts of providing care. Targeted support of this nature is not possible without research based evidence. In addition to allowing for support of dual carers through the identification of the impacts of providing dual care, this research also paves the way for working out how to ensure that care is provided to those in Australia who need it. Identification of the characteristics that make people more likely to become dual carers provides the necessary information to speculate and make informed projections about the likely supply of dual carers in the future.

Summary

The findings of this research suggest that dual carers are meaningfully different from other Australians. Specifically, the predictors and impacts of dual caring are significantly different to those of informal carers, child carers and those with no caring responsibilities. This is the first Australian study to fully investigate the characteristics that predict dual caring, and the effects that dual caring has on Australians. The research therefore extends our knowledge of the provision of care in Australia in general, and the provision of dual care specifically.

Appendix

Appendix A: Data weights

The HILDA data set is provided with a wide array of cross sectional and longitudinal weights, and HILDA users are offered in-depth advice on how to select and utilise those weights (Henstridge 2001, Watson 2004, Watson 2012, Summerfield, Freidin et al. 2014). The purpose of data weights is to ensure the groups who may be under-represented in the sample (compared to the actual population) are weighted so that their responses are 'heavier' in any analysis performed on the data (Kohler and Kreuter 2012: 65-68). This under-representation can be due to initial non-response (when potential respondents never participate in any waves of a survey) or attrition over time (when respondents participate initially, then drop out temporarily or permanently) (Kalton and Brick 2000). Specifically, weights are provided with the HILDA data to "adjust for unequal probabilities of selection and for non-response" (Watson 2012: 1).

It is useful to present an example to fully explain the purpose of data weighting. In the HILDA survey the Aboriginal and Torres Strait Islander population is under-represented (Watson 2012). In other words, there are proportionally more Aboriginal and Torres Strait Islander Australians in the total population than are represented in the HILDA data set. Therefore, the responses of HILDA participants who identify as Aboriginal or Torres Strait Islander are statistically worth slightly more than others, thus accounting for the difference between the sample and the actual population. Weights for the under-represented are therefore greater than one, whereas weights for the over-represented will be smaller than one (Summerfield, Freidin et al. 2014).

In addition to cross-sectional survey weights, HILDA also provides longitudinal weights. The longitudinal weights are provided to account for the

unequal attrition over time of different groups, and to benchmark to the characteristics of the first wave of HILDA (Summerfield, Freidin et al. 2014). This means that there are certain characteristics which are associated with reduced response rates as the survey goes on. HILDA creators have identified a number of characteristics as being particularly susceptible to attrition (Watson 2012: 8). These include respondents who are:

- relatively young (aged between 15 and 24 years);
- born in a non-English speaking country;
- of Aboriginal or Torres Strait Islander descent;
- single;
- unemployed; or
- working in low-skilled occupations.

In terms of the HILDA data weights applied to analysis within this thesis, cross-sectional data weights are used occasionally and longitudinal data weights are not used. The research in this thesis make use of the cross-sectional weights provided for wave 13. These are primarily the descriptive results found in Chapter Five – Illustrating Dual Care in Australia, specifically reporting of frequencies and cross-tabulations. The results presented will explicitly state where and when those weights have been used.

Although HILDA provides comprehensive longitudinal weights, this thesis does not apply them to any analysis. The reasons for this are twofold. Firstly, the longitudinal weights are generally appropriate only when using the balanced data set (Watson 2012, Melbourne Institute of Applied Economic and Social Research 2016). As will be explained in further detail later in this chapter, HILDA data is provided as an unbalanced data set (all respondents may not be present for all waves). It can be transformed into a balanced panel by dropping out all respondents who are not present for every wave, however I decided not to balance the data due to the resulting significant data losses.

This leaves the longitudinal weights inapplicable to the data set. The second reason for excluding longitudinal weights is to do with the type of analysis performed on the longitudinal data. Weighting is appropriate when performing descriptive analysis such as summary statistics or tabulations, but its usefulness and suitability in more complex analyses is in doubt. As such, longitudinal weights are not applied to the analyses presented in Chapters Six and Seven (nor are cross-sectional weights) because they are not appropriate.

Appendix B: Multilevel model comparison tables

Appendix Table B.1 Model comparison for relationship status

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	26	4	Non-convergent	
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	29	7	36	3480.2
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	29	4	33	3619.1
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	29	7	Non-convergent	
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	29	4	33	5355.6
F	***With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time***	***Model A + Care + CareBYTime***	***Intercept, Time, Care, CareBYTime***	***32***	***11***	***43***	***3279.2***
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	32	7		Non-convergent
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	32	7	39	3300.7
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	32	4	36	3437.4

Appendix Table B.2 Model comparison for labour force participation

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	23	4	27	67100.773
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	26	7	33	66922.682
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	26	4	30	66952.887
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	26	7	33	67033.441
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	26	4	30	67059.43
F	***With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time***	***Model A + Care + CareBYTime***	***Intercept, Time, Care, CareBYTime***	***29***	***11***	***40***	***66761.103***
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	29	7	36	66770.539
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	37	7	44	988862
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	37	4	41	988906

Appendix Table B.3 Model comparison for income

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	29	4	33	326347.8
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	32	7		Non-convergent
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	32	4	36	325584.7
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	32	7	39	325921
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	32	4	36	325931.6
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	24	11	35	325558.7
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	35	7	42	325569.1
H	***With discontinuities in elevation and slope, only random effect of CareBYTime, time***	***Model F***	***Intercept, Time, CareBYtime***	***35***	***7***	***42***	***325562.4***
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	35	4	39	325579.5

Appendix Table B.4 Model comparison for general health

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	31	4	35	910471.9
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	34	7		Non-convergent
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	34	4	38	910442.7
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	34	7	41	910439
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	34	4	38	910440.7
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	37	11		Non-convergent
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	37	7	44	910436.8
H	***With discontinuities in elevation and slope, only random effect of CareBYTime, time***	***Model F***	***Intercept, Time, CareBYtime***	***37***	***7***	***44***	***910435.1***
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	37	4	41	910438.5

Appendix Table B.5 Model comparison for vitality

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	31	4	35	932332.8
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	34	7	41	932088.5
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	34	4	38	932122.4
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	34	7	41	932204.7
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	34	4	38	932233.2
F	***With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time***	***Model A + Care + CareBYTime***	***Intercept, Time, Care, CareBYTime***	***37***	***11***	***48***	***932081.2***
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	37	7	44	932090.3
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	37	7	44	932085.3
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	37	4	41	932119.3

Appendix Table B.6 Model comparison for physical functioning

Model	Description	Fixed effects	Variance components	n parameters for… Fixed effects	n parameters for… Variance components	df	Deviance
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	31	4	35	939567.9
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	34	7		Non-convergent
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	34	4	38	939479.5
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	34	7		Non-convergent
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	34	4	38	939484.7
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	37	11		Non-convergent
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	37	7	37	939461.4
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	37	7		Non-convergent
I	***With discontinuities in elevation and slope, only random effect of time***	***Model F***	***Intercept, Time***	***34***	***4***	***41***	***939470.1***

Appendix Table B.7 Model comparison for bodily pain

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	31	4	35	979214.5
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	34	7	41	979155.7
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	34	4	38	979187.8
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	34	7	41	979175.9
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	34	4	38	979188.1
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	37	11		Non-convergent
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	37	7	44	979171
H	***With discontinuities in elevation and slope, only random effect of CareBYTime, time***	***Model F***	***Intercept, Time, CareBYtime***	***37***	***7***	***44***	***979151.5***
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	37	4	41	979183.1

Appendix Table B.8 Model comparison for mental health

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	31	4	35	910510.3
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	34	7	41	910392.6
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	34	4	38	910467.7
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	34	7	41	910420.3
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	34	4	38	910474.7
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	37	7	44	910387.4
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	37	7	44	910406.7
H	***With discontinuities in elevation and slope, only random effect of CareBYTime, time***	***Model F***	***Intercept, Time, CareBYtime***	***37***	***7***	***44***	***910387.4***
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	37	4	41	910461.2

Appendix Table B.9 Model comparison for emotional health

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	31	4	35	881357.6
B	***With a discontinuity in elevation, not slope***	***Model A + Care***	***Intercept, Time, Care***	***34***	***7***	***41***	***881253.4***
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	34	4	38	881323.8
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	34	7	41	881288.7
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	34	4	38	881337
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	37	11		Non-convergent
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	37	7	44	881274.7
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	37	7	44	881252.9
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	37	4	41	881323.4

Appendix Table B.10 Model comparison for social functioning

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	31	4	35	988980.2
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	34	7	41	988867.9
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	34	4	38	988912.2
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	34	7		Non-convergent
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	34	4		Non-convergent
F	***With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time***	***Model A + Care + CareBYTime***	***Intercept, Time, Care, CareBYTime***	***37***	***11***	***48***	***988856.3***
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	37	7		Non-convergent
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	37	7	44	988862.2
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	37	4	41	988906.4

Appendix Table B.11 Model comparison for psychological distress

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	31	4	35	233187.2
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	34	7	41	233099.9
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	34	4	38	233147.2
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	34	7	41	233095
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	34	4	38	233145.5
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	37	11		Non-convergent
G	***With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time***	***Model F***	***Intercept, Time, Care***	***37***	***7***	***44***	***233090.3***
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	37	7	44	233095.1
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	37	4	41	233140.9

Appendix Table B.12 Model comparison for general life satisfaction

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	32	4	36	405552
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	35	7	42	405454.3
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	35	4	39	405476.7
D	***With a discontinuity in slope, not elevation***	***Model A + CareBYTime***	***Intercept, Time, CareBYTime***	***35***	***7***	***42***	***405453.6***
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	35	4	39	405476
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	38	11		Non-convergent
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	38	7	45	405442.7
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	38	7	45	405506.1
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	38	4	42	Non-convergent

Appendix Table B.13 Model comparison for satisfaction with free time

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	32	4	36	529442.3
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	35	7	42	527046
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	35	4	39	527118.2
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	35	7	42	527835.8
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	35	4	39	527881.9
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	38	11		Non-convergent
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	38	7	45	527064.2
H	***With discontinuities in elevation and slope, only random effect of CareBYTime, time***	***Model F***	***Intercept, Time, CareBYtime***	***38***	***7***	***45***	***527040.2***
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	38	4	42	527112.6

Appendix Table B.14 Model comparison for satisfaction with health

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	32	4	36	454489.9
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	35	7	42	454420.2
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	35	4	39	454443.6
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	35	7	42	454422.2
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	35	4	39	454444.4
F	***With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time***	***Model A + Care + CareBYTime***	***Intercept, Time, Care, CareBYTime***	***38***	***11***	***49***	***454400.9***
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	38	7	45	454410.4
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	38	7	45	454410.6
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	38	4	42	454432.6

Appendix Table B.15 Model comparison for satisfaction with the home lived in

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	32	4	36	496036.6
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	35	7	42	495626.9
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	35	4	39	495660.5
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	35	7	42	495755.3
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	35	4	39	495783.5
F	***With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time***	***Model A + Care + CareBYTime***	***Intercept, Time, Care, CareBYTime***	***38***	***11***	***49***	***495611.8***
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	38	7	45	495630.4
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	38	7	45	495624.6
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	38	4	42	495658.3

Appendix Table B.16 Model comparison for satisfaction with financial situation

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	32	4	36	491175.9
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	35	7	42	490947.1
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	35	4	39	490975.9
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	35	7	42	491004.8
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	35	4	39	491018.7
F	***With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time***	***Model A + Care + CareBYTime***	***Intercept, Time, Care, CareBYTime***	***38***	***11***	***49***	***490929.1***
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	38	7	45	490951.9
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	38	7	45	490937.1
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	38	4	42	490966

Appendix Table B.17 Model comparison for satisfaction with feeling safe

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	32	4	36	452658.4
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	35	7	42	452472.1
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	35	4	39	452517.6
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	35	7	42	452491
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	35	4	39	452570.7
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	38	11		Non-convergent
G	***With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time***	***Model F***	***Intercept, Time, Care***	***38***	***7***	***45***	***452430.2***
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	38	7	45	452464
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	38	4	42	452509.1

Appendix Table B.18 Model comparison for satisfaction with the local community

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	32	4	36	497862.6
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	35	7		Non-convergent
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	35	4	39	497846.4
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	35	7	42	497840
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	35	4	39	497843.6
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	38	11		Non-convergent
G	***With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time***	***Model F***	***Intercept, Time, Care***	***38***	***7***	***45***	***497837.6***
H	With discontinuities in elevation and slope, only random effect of CareBYTime, time	Model F	Intercept, Time, CareBYtime	38	7		Non-convergent
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	38	4	42	497841.2

Appendix Table B.19 Model comparison for satisfaction with employment opportunities

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	32	4	36	401150.3
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	36	7	43	401081
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	35	4	39	401114.6
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	35	7	42	401076.4
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	35	4	39	401099.2
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	38	11		Non-convergent
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	38	7	45	401072.4
H	***With discontinuities in elevation and slope, only random effect of CareBYTime, time***	***Model F***	***Intercept, Time, CareBYtime***	***38***	***7***	***45***	***401061.6***
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	38	4	42	401095.6

Appendix Table B.20 Model comparison for satisfaction with the neighbourhood lived in

Model	Description	Fixed effects	Variance components	n parameters for…		df	Deviance
				Fixed effects	Variance components		
A	Baseline	Intercept, time, and all relevant independent variables	Intercept, Time	32	4	36	484101.3
B	With a discontinuity in elevation, not slope	Model A + Care	Intercept, Time, Care	35	7	42	484065.8
C	With a discontinuity in elevation, not slope	Model B	Intercept, Time	35	4	39	484091.9
D	With a discontinuity in slope, not elevation	Model A + CareBYTime	Intercept, Time, CareBYTime	35	7		Non-convergent
E	With a discontinuity in slope, not elevation	Model D	Intercept, Time	35	4	39	484097.9
F	With discontinuities in elevation and slope, allowing the magnitude of Care and CareBYTime to vary over time	Model A + Care + CareBYTime	Intercept, Time, Care, CareBYTime	38	11		Non-convergent
G	With discontinuities in elevation and slope, allowing the magnitude of Care to vary over time	Model F	Intercept, Time, Care	38	7		Non-convergent
H	***With discontinuities in elevation and slope, only random effect of CareBYTime, time***	***Model F***	***Intercept, Time, CareBYtime***	***38***	***7***	***45***	***484063.8***
I	With discontinuities in elevation and slope, only random effect of time	Model F	Intercept, Time	38	4	42	484089.9

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[i] The Australian Bureau of Statistics have conducted a more recent SDAC in 2015, however at the time of writing only preliminary results were available, which did not include information on carers.
[ii] The Australian Bureau of Statistics states that much of the content of the SDAC's are comparable over time, however, due to attempts to obtain better coverage in more recent surveys, some of the apparent increase in number of carers could be due to more carers being identified, not just more people providing care.
[iii] The Depression, Anxiety, and Stress Scale, developed by Loviband and Loviband (Loviband, S. H. and P. F. Loviband (1995). Manual for the Depression Anxiety Stress Scales. Sydney, Psychology Foundation.